

# BUTANE-PROPANE

## News

25¢



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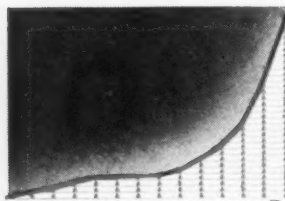
FEBRUARY 1942



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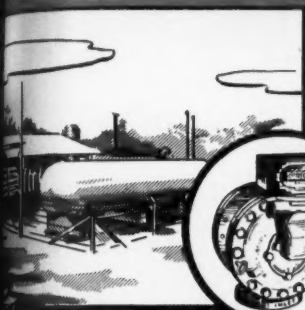
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Because of the urgent need of materials for the emergency, deliveries may be interrupted. Pressed Steel Tank Company, in addition to doing its share during the emergency is doing its utmost to continue to serve its customers.

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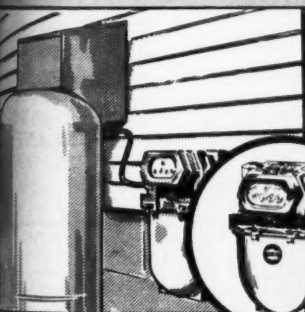
STORAGE PLANT

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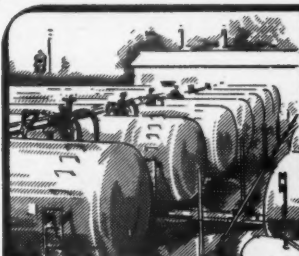


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# BUTANE-PROPANE News



Reg. U. S. Pat. Off.

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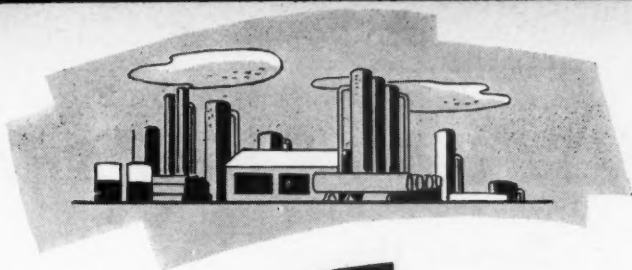
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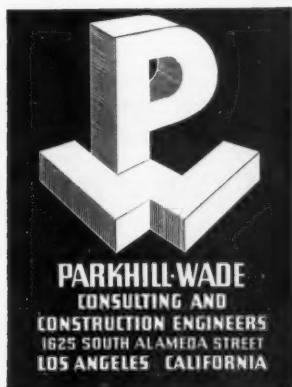
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**CONSULTING & CONSTRUCTION  
ENGINEERS  
TO THE  
LP-GAS INDUSTRY  
FOR THE  
ENGINEERING, DESIGN & CONSTRUCTION  
OF PLANTS  
FOR THE FRACTIONATION OF ALL  
LIGHT HYDROCARBONS**



# **FISHER LEADERSHIP**

**Serves the**

**L. P. G. INDUSTRY**

*Keeping Pace in 1941 . . .* The past year witnessed another remarkable growth in the Liquefied Petroleum Gas Industry. A new record production of FISHER regulators in 1941 is ample proof of the important part Fisher Governor Company played in that expansion. It is also concrete evidence of our desire to always serve the industry to the best of our ability. Yes—we are proud of our ability to maintain this pace in spite of production difficulties incidental to the National Emergency.

*A Pledge for 1942 . . .* To the industry, Fisher Governor Company pledges, for 1942, a continuation of its best efforts in the production of regulators, regulator assemblies and accessories. Our complete line of control equipment will be available in quantities dependent on the availability of materials. Also we will maintain a complete replacement parts service to assist the industry in keeping all operating equipment in running order.

*A Promise for the Future . . .* The FISHER program of development and research is continuing uninterrupted by the present emergency. Greater control sensitivity, improved dependability, longer life, economy, and customer convenience are some of the aims of FISHER engineers in this program of better regulation for the L. P. G. Industry.

**FISHER**  
**GOVERNOR COMPANY**  
**MARSHALLTOWN, IOWA**

# LETTERS

Gentlemen:

Can you tell me if propane gas can be successfully used to heat a greenhouse for propagating plant seeds and plants with an unvented gas heater?

The essential problem is whether or not the products of combustion from the gas are injurious to the plants. The case in question would be simple to solve if an unvented heater can be used successfully.

E. J. T.

California

Propane gas is not believed to be harmful when used in a greenhouse in which plant seeds and plants are being propagated.

We suggest that you write to the F. & E. Manufacturing Co., Centerville, Calif., Ransome Co., Emeryville, Calif., and the Barber Gas Burner Co., 3704 Superior Ave., Cleveland, Ohio, for information concerning special burners which have been developed for greenhouses and similar usage. It is quite possible that they can also give you detailed information regarding the experiences of others who have used liquefied gas in greenhouses.—Ed.

Gentlemen:

Can you give us information on codes governing the storage and distribution of liquefied petroleum gases, and statutes enacted by the various States?

J. E. D.

Ohio

All states do not have statutes covering the uses of liquefied petroleum gases, but many of them do and the balance probably will pass legislation before long. However, as the industry grows, revisions in state codes are made frequently and it is difficult to keep abreast of them. As a general rule, codes governing the uses of liquefied petroleum gases follow very closely Pamphlet No. 58 of the National Board of Fire Underwriters. A copy of this can be obtained without cost from that organization at 85 John St., New York City; 222 W. Adams St., Chicago, or Merchants Ex-

change Bldg., San Francisco. The Interstate Commerce Commission also publishes regulations governing the shipment of cylinders interstate and copies of their regulations may be had from the Superintendent of Documents, Washington, D. C.

Using these two code books as a basis for general operations, you will very likely closely adhere to the important provisions of all State regulations.—Ed.

Gentlemen:

We are thinking very strongly of converting one of our trucks over to butane fuel. We understand that it will give increased horsepower and increased mileage over a regular gasoline engine.

It is also necessary that we have refrigerated bodies on our trucks. We have heard that there is some way to put butane through the truck body so that it evaporates, making refrigeration. Will you please inform us on these matters?

C. P. P.

Montana

Increased horse power can be obtained from such a conversion if cold manifolds and increased compression ratios are used. Usually you cannot expect to obtain any increase in mileage. However, oil consumption is usually not more than 50% of what is burned when using gasoline, and the wear and tear on the motor is reduced even to a larger percent than that. Heavy-duty trucks frequently run from 60,000 miles without overhaul when using butane, and some have gone as much as 180,000 miles before being taken down. Those facts, and the additional one that butane generally sells for less than gasoline, help to indicate the value of a changeover.

It is not considered practical to use your motor butane system for refrigeration in a truck body on the same chassis unless the truck is operated more than 500 miles per day. In the usual truck operations there are too many stops and too many long periods

when the motor is not running to give you sufficient refrigeration action. You can, however, install a separate power unit to operate on butane which would give you constant refrigeration.—Ed.

Gentlemen:

Can propane be used as successfully for automotive uses as butane, with butane equipment on the truck?

A. D. A.

Montana

You will find no difference in the efficiencies of the two fuels for internal combustion engine usage. However, when changing over to propane it will be necessary to install a heavier fuel tank, for one built for butane would not conform to the code covering propane usage. A propane tank of any size must be constructed to withstand a 250-lb. per sq. in. working pressure. Of course, it is assumed that any propane tank would be equipped with a relief valve set as required for propane pressures.

If a specially fine adjustment is desired, the carburetor may be set slightly more on the rich side because the heating value of propane on a volume basis is slightly less than that of butane. No other changes are necessary.—Ed.

Gentlemen:

I am interested in a distributorship of a good butane carburetor for tractors and trucks in a territory comprising the south half of Texas and the south half of Louisiana. I have both the money and the experience to do a good job on such a product.

If you will put me in touch with manufacturers of this type of equipment it will be much appreciated.

L. F.

Texas

We believe we can serve you in no better way than to send you a copy of the last issue of *BUTANE-PROPANE News*, in which you will find advertisements of several carburetor manufacturers.—Ed.

Gentlemen:

I think that in one of your next issues of *BUTANE-PROPANE News* the attention of the members of the Lique-

fied Petroleum Gas Association should be called to the wonderful services that organization is giving its members on priorities through the diligent work of its committee chairman, E. L. Mills, and its secretary, F. R. Fetherston.

They have kept my company posted on all changes made and it has been much easier for us to know which way to turn.

HERMAN PARIS

Georgia Butane Gas Company  
Sandersville, Georgia

Gentlemen:

The California Division of Immigration and Housing has notified one of our customers, who operates a motor hotel, that the gas heaters used in all the units must be rigidly connected with metal piping directly to the gas service inlet and every heater must be vented to a vertical flue leading to the outer air above the roof.

Please give us information on this subject.

J. S. B.

California.

In California the Health and Safety Code, Part 2, Division 13, stipulates that rigid connections and outside venting are mandatory.—Ed.

Gentlemen:

Will you please advise me where I can secure complete specifications (A.S.M.E.) on bulk storage, tanks, truck and transport tanks for propane.

H. S. R.

Connecticut

For complete specifications (A.S.M.E.) on bulk storage tanks, address the American Society of Mechanical Engineers at 29 W. 39th St., New York City, requesting a copy of the A.S.M.E. code of 1940.—Ed.

● *BUTANE-PROPANE News* welcomes letters from our readers, but it must be understood that this magazine does not necessarily concur in opinions expressed.—Editor.

**BUTANE-PROPANE News**

# **CALORIC Gas Ranges** **are engineered to operate** **perfectly** **with L-P Gas**

All burners on handsome Caloric Gas Ranges—including oven burners—have been thoroughly tested for satisfactory performance with L-P Gas. Housewives say that these economical ranges give better cooking results with all the popular types of "bottled" gas.

Most of the Caloric ranges feature a special Harper Burner System adapted for the efficient use of L-P Gas. Tests have proved that these time-saving burners also save up to 39% on fuel.



Caloric Gas Ranges, in a variety of models, may be ordered from seventeen District Offices over the country. Write for the name of the nearest Caloric representative.

**CALORIC GAS STOVE WORKS, PHILADELPHIA, PA.**





**HENRY N. WADE**  
**Guest Editor for February**



# *The Qualities that Win Wars*

By HENRY N. WADE

President, Parkhill-Wade, Los Angeles

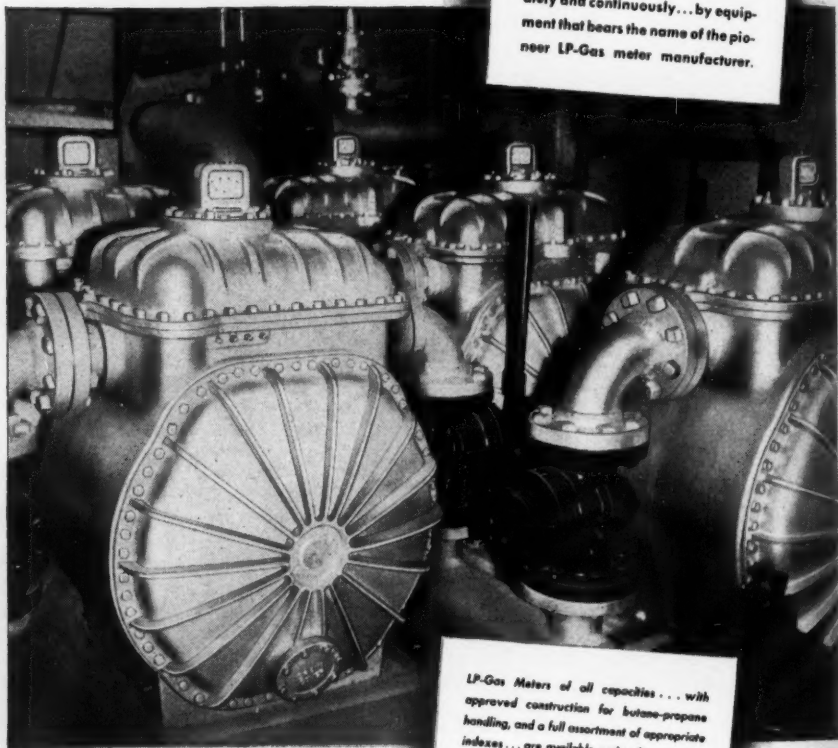
**T**HE development of the liquefied petroleum gas industry is one more typically American story of the conversion of waste into useful things. Even 10 years ago, butane and propane were largely waste materials; by-products principally of natural gasoline manufacture. A fraction of the easily available supply was used as "bottled gas," but the bulk of it was looked upon as a nuisance and was blown to the air.

As a matter of history, the parent material, natural gasoline itself, appeared first as a troublesome by-product. About 30 years ago the beginnings of natural gasoline appeared as drips in gas transmission lines. One of the early ways of disposing of such gasoline, in order to keep the lines clear, was to hire a neighboring farmer to drain it off, haul it to a swamp, and burn it. Later with the growth of the use of motor gasoline, natural gasoline came to be recognized as its most important single constituent.

During the last two or three years the relation of butane and propane to the natural gasoline industry has entirely changed. Previously plants were designed to produce natural gasoline efficiently and such design automatically yielded enough butane to meet vapor pressure specifications. The development of uses of butane and propane for fuel direct, and for chemical conversion into special aviation stocks, now requires that the plant design be focussed on the efficient extraction of butane; highly efficient recovery of the heavier fractions follows as a matter of course.

Thus the history of butane and propane illustrates perfectly what can be done by the application of American research and engineering ability. This is the sort of thing that wins wars and makes for prosperity in times of peace.

# A Battery Goes into Action at Camp Haan



In the propane plant at Camp Haan, in California, this battery of METRIC-AMERICAN Ironcase 500-B's is helping Uncle Sam keep both gas supply and accounts straight. • Each of these five busy meters (LP-Gas type) is handling better than its conservatively rated 10,540 cu. ft. per hr. capacity of propane, measured at 15 lbs. gage. The plant's propane delivery thus is measured accurately and continuously... by equipment that bears the name of the pioneer LP-Gas meter manufacturer.

LP-Gas Meters of all capacities... with approved construction for butane-propane handling, and a full assortment of appropriate indexes... are available under the AMERICAN and METRIC-AMERICAN brands. Helpful CATALOG LPO-4 mailed you at your request.

## AMERICAN METER COMPANY

INCORPORATED, (ESTABLISHED 1836)

GENERAL OFFICES • 60 EAST 42ND STREET, NEW YORK 17, N.Y.

17-01

# MAINLY BEYOND THE MAINS

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## It's Later Than We Think

We view with undisguised alarm a lassitude in both governmental and industry circles toward facing the immediate problem of coordinating the present and potential war demands for LP-Gas, particularly butane, with a continuing supply for domestic purposes.

We do not contend—we do not even imagine—that the industry can entertain any hopes of either fuel or equipment being available for *expansion* purposes during 1942. We have never participated in the wishful thinking of those who tried to believe that, somehow, LP-Gas would come through the greatest shock that has ever hit our nation and its economic system with nothing worse than a few minor bruises. But neither do we believe that either the interests of defense or the end of victory can be served by subjecting the entire butane or propane consuming public to a brutal disregard of their requirements *unless, and until, the exigencies of war make such extreme measures necessary.*

Yet, there are signs abroad to indicate that just such a thing is imminent unless immediate and genuine cooperation and coordination is established be-

tween all of the factors that comprise the LP-Gas industry and the Government.

As a source of butane and isobutane for aviation gasoline, and of butadiene for synthetic rubber, the industry is highly regarded, and the technical experts who can give counsel and guidance on these phases of production and utilization are listened to with respect. These and other essential military uses of LP-Gas are vital to our war machine, vital indeed to our very existence as a nation; and we commend the self-sacrifice and the patriotism with which the producers and refiners have stepped to the fore with their full facilities to meet the demand.

But who is going to champion the cause of the million and three-quarters families in the United States who look upon this gas as their principal, and in some cases their only, fuel supply? Is the whole case for this indispensable contribution to community health and civilian morale to be dismissed with the glib observation, "Luxuries must go!" or, "Let them cook with coal or wood?"

Sadly remiss in knitting themselves into a cohesive and a coherent national industry have been the dealers and distributors

in both butane and propane. Content to drift along in any eddy that the producers and the manufacturers of equipment have set up, they have concerned themselves with occasional lusty lunges at their competitors and happy dreams of an expansion cycle that would never end.

Now the days of industry infancy are over and almost without warning the wholesale and retail distributors of gas for domestic use find themselves jerked into man's estate and shouldered with adult responsibilities. The refiners who only yesterday could be called in for consultation on every teething crisis are today preoccupied with the problems of wartime production. The manufacturers of appliances and equipment who once supplied their customers with everything from free advice to free Scotch are busy turning their plants into producing units for ordnance and bombs.

*But the obligation of the dealer to his domestic users of LP-Gas is not lessened but is rather increased as the problems of supplying them with fuel multiply.*

It is in the very discharge of this mounting obligation that the opportunities for service, and the safeguarding of industry survival meet on common ground. No Government agency is going to concern itself with the life or death of a single bottled gas business—or of a hun-

dred; but by the same token no agency is going to discard lightly the welfare of hundreds, of hundreds of thousands, of families on farms and in suburban communities who must have this fuel if they are to eat cooked food.

This is not a case of the industry banding together to fight selfishly for its own rights as opposed to the National welfare. It is rather a recognition that the obligations of the industry and of the National welfare are inseverably joined, and can be served only by the fullest cooperation of Government and industry.

For the moment the best service that any dealer and distributor can render himself, his industry and his country, is to identify himself with the Liquefied Petroleum Gas Association. In reply to the Association sponsored questionnaire, which he has received, or will receive, he should answer fully and honestly every question that has been asked. Once armed with the facts that the compilation of these returns will produce, the Association must lose no time in seeing that the full story of their significance is placed before the highest authorities of the Office of the Petroleum Coordinator.

Meantime, there must be originated and completed in the OPC an intelligent and complete National survey of the total plant capacity for producing LP-Gas, and so far as is possible, an estimate of the mounting month-by-month requirements of the butanes and the butane transportation equipment that will be required to meet the demands

for the essential war stocks.

We submit that neither the liquefied petroleum gas industry nor the Office of the Petroleum Coordinator can bluff its way through the currently unsolved butane-propane problem. Each has a job to do, and each has been too slow in facing the realities and undertaking it. We do not believe that there is a man from the top to the bottom in either this industry or in the service of the Government who does not set patriotism above every consideration of self-interest and personal pride.

But we also know that lofty appeals to high ideals, alone, cannot do the job that has to be done. There is spade work ahead—tough spade work—and it must be directed by intelligent, unemotional thinking, based on a full knowledge of the facts and a broad grasp of their significance to the welfare and safety of the nation.

## New Horizons

Right now, when every conversation begins with allocations and ends with bombs, it is at once a stimulant and a relief to receive for publication an article like the one by Dr. Peter Schlumbohm, appearing on page 20 of this issue.

Too often in the past we have prayed for strength to resist the assaults of electrical competition, forgetting for the moment that in inter-industry war-

fare the tactical truism that "the best defense is a vigorous offense" always applies.

Looking at propane from the standpoint of an inventor and a scientist, the writer envisions it as the ideal source of heat, refrigeration and motive power for the detached single family dwelling, and particularly for the farmhouse. Indeed he assigns to electricity only the lighting job, and even in this, we suspect, he is reluctant to concede it any great superiority over gas.

It is well to remember that wartime, although customarily referred to as a period of self-sacrifice and denial, is also a time of opportunity where imagination and vision are generously mixed with the all-out effort to defeat the enemy. The vision of tomorrow's possibilities can never be cut down to the confines of today's limitations, lest progress once halted can never be resumed.

Even though at times we may feel that we are fighting with our backs to the wall, it is heartening to be reminded that the broad horizons still lie ahead, and to realize that ours is an industry that literally knows no limitations. Those who have matched its potentialities with their own individual initiative and courage have been richly rewarded in the past, and none but the timid soul would deny the great possibilities that lie in the future.

# KEYED TO WAR

- What the Government Wants
- What the Industry Can Do

**A**PPROXIMATELY 300 members of the liquefied petroleum gas industry, meeting in New Orleans on Jan. 9, voted to give full support to the National Government in the war emergency program, even to the end of curtailing their own development activities, if need be, in order to extend this aid.



J. W. MARTIN

In an executive board meeting of Liquefied Petroleum Gas Association, following the general meeting, it was decided to postpone the promotional program of the industry for which plans were recently launched and cancel the annual convention of the Association which was to have been held in Kansas City, Feb. 23-24.

Another development originating in the Board meeting is the opening by the Association of a Washington office. Further particulars about this will be announced later by the Association.

Still another development of far reaching effect announced at New Orleans pertains to the request for a recommendation by the Associa-

tion of a representative of the industry to join the OPC staff at Washington. It was suggested that such a man be entirely familiar with industry problems, enjoy the confidence of all branches, and be acceptable to OPC.

The New Orleans gathering voted to recommend to the Board of Directors of the Association that Woodward Martin, Lone Star Gas Co., Dallas, Texas, a past president of the Association, be suggested to the OPC.

So earnestly did the spirit of endeavor and forward-looking action permeate the New Orleans meeting that 48 firms and individuals signed applications for membership, and numbers of others signified their intention of joining just as soon as they returned to their company headquarters.

Now is certainly the definite rallying time of the industry behind the program of the Association and BUTANE-PROPANE News joins the Executive Board of the Association in urging all to align themselves with it. As mentioned above, this program will include the office at Washington; also, increased activities on the part of the Association in New York, whose

By CRAIG ESPY



personnel must be enlarged in order that the best interests of the industry be adequately looked after. This program will require money in the form of dues.

#### Mr. Raigorodsky Attends

George Bach, president of the Association, presided over the New Orleans meeting which had been called so that members of the industry could discuss first-hand with government representatives the developments taking place which affect the LP-Gas industry. The meeting was attended by Paul Raigorodsky, Assistant Director of Production, Office of the Petroleum Coordinator of the Gas and Natural Gasoline Division.

Some of the important subjects discussed at this conference were:

The Government wants the industry to continue in business within the limits determined by the war program.

Mr. Raigorodsky remarked that the fuel requirements change very rapidly with the need for butane growing with the advancement of the war program. The Government requirement for isobutane and normal butane a week ago was considerably less than it is now. He stated that the Government did not contemplate the naming of LP-Gas as a critical material to be placed on a priority basis. His recommendation is that every one who can, produce more LP-Gases but indicated that steel for the purpose would have to stand its chance along with the demand for steel for other purposes.

What is required right now, he said, is for the industry to sup-

#### How to Cooperate

Things you can do to help your industry at this time:

(1) Join your Association. This is not the time to wage, individually, the battle on the problems of the industry. Now is the time to fight collectively. So join your Association. Every one engaged in the business should join in order to help the industry carry on a strong program for your good, in trying times. Your dues are needed.

(2) The minute you receive your questionnaire, mentioned in the article, fill it in. The information you will give will be confidential, going direct to a firm of certified public accountants. The Government must have the information about the industry. It is your duty and privilege to comply.

ply the office of the Petroleum Coordinator with facts about the volumes of LP-Gas handled in 1940 and 1941 by each member, the number of tank cars owned, the number of tank trucks and transports owned, along with other information of this character. He will present these figures and estimates of gas production and available supply to the proper government officials.

#### Will Send Questionnaires

To facilitate the gathering of information of this character to be submitted to the Government, George Bach, president, and F. R. Fetherston, secretary of the Association, announced the preparation of questionnaires that will be sent to the companies of the industry. The group was strongly urged to immediately respond to the questionnaires which are to be returned by the ones who fill them in to a firm of independent certified public accountants who will record the statistics.

It was stressed everyone must see that his business is reported, as only such immediate response and complete information will make it possible to coordinate non-defense demand with war requirements. The information will be confidential and only compiled figures will be released.

#### Constructive Steps Taken

Some of the work being done by the Association at the present time to alleviate conditions includes the efforts being made with the Interstate Commerce Commission to increase the approved loading densities for rail shipment. Authorization is also being sought to move butane in casinghead gasoline tank cars. Permission is being sought to use other fuel storage facilities for butane. An effort is also being made to move transport trucks 24 hours per day. Work will be done with the railroads to increase movement of tank cars. Some may request industries they

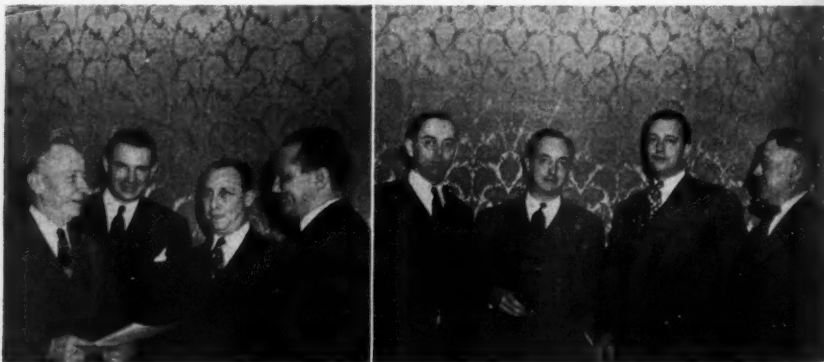
#### LP-GAS EQUIPMENT GIVEN ASSIGNMENT

As we go to press, word has been received from Washington, D. C., that the application for LP-Gas equipment will be assigned under the jurisdiction of the Plumbing and Heating Divisions of OPM.—Ed.

serve, wherever possible, to change over to substitute fuels. Some have also brought to the attention of the Government the need for discouraging the use of LP-Gases in Government projects wherever substitute fuels can be used.

#### Work of Officials Praised

The splendid work of F. R. Fetherston and E. L. Mills of the Defense Coordination Committee was officially recognized by the body in passing a resolution giving them a special vote of thanks for their work in this connection.



Among those attending the Jan. 9 joint meeting between representatives of the Government and the Liquefied Petroleum Gas Association were (left to right): E. L. Mills, vice president; George W. Bach, president, L.P.G.A.; F. R. Fetherston, secretary; Paul Raigorodsky, Assistant Director of Production, Office of the Petroleum Coordinator; H. Emerson Thomas; K. H. Koach; Luke Abramson; C. L. Parkhill, vice president.

# Baby Food Must be Pure

## So Propane Gets the Job

By ELLIOTT TAYLOR

THE best known baby in the world may or may not be some new movie starlet, with a million dollars worth of publicity and 24 sheet posters to acclaim his or her fame. But as far as the Gerber Products Co., of Fremont, Mich., is concerned, he is the little guy that appears on every can of Gerber's strained baby food, and now is brightening up the package of a new product, Gerber's dry pre-cooked cereal, which made its initial appearance on the market a few months ago.

Propane plays a big part in the preparation of this new infant food, and the manner in which it is used is not only an endorsement of the fuel for its heating qualities, but is also a testimonial to its uniformity, flexibility, and the cleanliness of the products of combustion, all of which are important factors in the Gerber story.

### Experiments Took Three Years

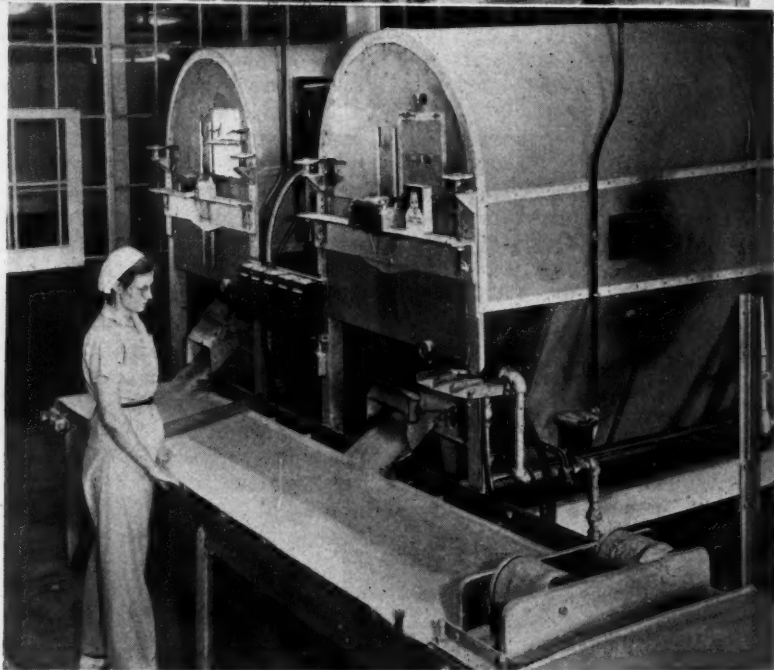
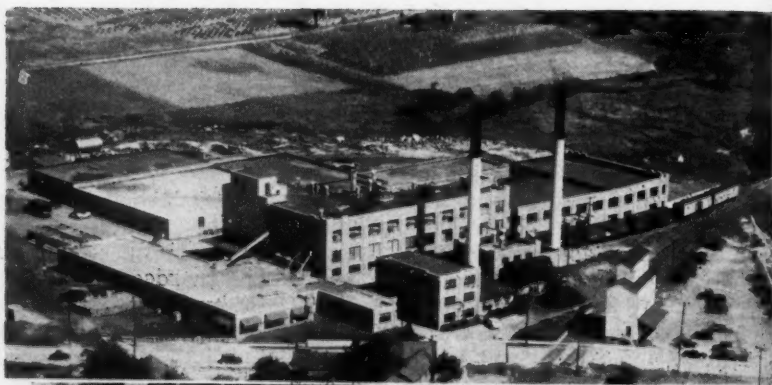
Three years of experimentation were required to develop the dry pre-cooked cereal food before it was adjudged perfect and ready for a place on the market alongside the old and well known line of canned strained vegetables. There is nothing simple about a baby food, as a list of the ingredients of this new cereal shows: whole wheat flour; semolina; corn meal; wheat germ; malt; dried brewer's yeast; dical-

cium phosphate; table salt, and soluble iron salt.

Since the delicate digestive tracts of infants are guarded with fanatical solicitude by both medicos and mothers, the simple compounding of satisfactory ingredients was only one step in the development of a finished package of pre-cooked cereal. It is one thing, for instance, to introduce the vital wheat germ, and it is another thing to leave it in the food in such a state that it will not result in early spoilage within the package. This is accomplished by the pasteurization that is part of the toasting process, and it is essential that the temperature be maintained at 170° F., as any higher temperature would result in the destruction of some of the vitamins that are so important in the formula.

After some experimentation with electricity, and the inevitable realization that with all its vaunted claims it was neither as flexible nor as economical as gas, the use of propane was tried out. Bottled gas in 100-lb. cylinders was used for an eight months' period, and at the end of that time it had completely sold itself to the Gerber management. A 15,000-gal. propane storage tank with unloading and handling equipment was then

## New Food—New Fuel



AT TOP: An aerial view of Gerber's modern plant in Fremont, Mich.  
BELOW: Discharge end of the toasting ovens. Here girls carefully inspect the cereal as it falls onto the conveyor belt leading to the weighing and packaging machines.

installed, and the cereal preparation process had been standardized.

Walter Hoagland, engineer with the Shell Oil Co., has adapted the design of the cylindrical rotary ovens in which the toasting is carried on to the use of propane. These ovens, two in number, have a combined capacity of about five tons of cereal per day. The revolving inner drums of the ovens, through which the pre-cooked cereal passes in the toasting operation, are heated by double rows of drilled pipe burners, firing directly against the drum, and with the products of combustion drawn off through the drum in which the cereal is carried.

That the products of combustion can thus come in direct contact with the food without contaminating it or affecting its delicate flavor is an indication of the purity of the commercial grades of propane now being delivered. The gas is odorized with ethyl mercaptan, but no trace of this reaches the package in which the food is packed.

Due to the fact that propane, rather than butane, had been selected as the fuel, there is no necessity for heat exchangers and the gas is fed to the burners under its own tank pressure reduced to 1 lb. and mixed with air for combustion in low pressure proportioners.

The ingredients of the food are thoroughly cooked before going to the toasting machine, but the pre-cooking is done with steam from coal fired boilers which handle all of the other cooking operations in making both the cereal and the strained can foods.



C. M. Caywood, purchasing agent, Gerber Products Co.; Walter Hoagland, engineer, Shell Oil Co., Inc.; Ora C. Harris, plant engineer, Gerber Products Co.

The toasting is primarily for the development of flavor, according to Lillian B. Storms, Ph.D., of the Gerber department of nutrition and service. There is also a secondary value in that the product is heated immediately prior to packaging, which has a sterilizing effect. Color and taste are important factors, and the light toasting gives the food a creamy tan color, which is more appetizing looking than the untoasted cereal.

Butane and propane have often been referred to as an infant (although a lusty infant) industry. That it here should be playing its important role in the preparation of one of America's popular prepared food for infants exemplifies the contention of the industry's enthusiasts—"If it's done with heat you can do it better with LP-Gas."

# Refrigerant Cycle of Propane Prior to Combustion

By DR. PETER SCHLUMBOHM

President, Propane Development Corp., New York City

WASHINGTON has to be sold on propane. Partly, it is already too late. For instance, the Army cannot change now from gasoline to propane. An unretrievable opportunity has been missed in this respect years ago. But it is not too late to sell the OPM on propane. Here, things are still in flux; and in the flood of regulations are certain watersheds, which are favorable to such an approach.

It can and must be shown, that propane saves critical materials, which are now consumed for civilian use.

It must be repeated: Shifting appliances from electricity to propane is saving critical materials while maintaining, or even raising, the standard of living.

It is amazing to what extent this could be done.

Electric appliances cover four fields, mainly: Heating, refrigeration, light and motive power. Huge quantities of critical materials, such as resistance wire, copper, brass and rubber insulation are required—seemingly inevitably—for such civilian uses.

Now, in those fields, with the exception of "light", propane can do a better and cheaper job than electricity; and it can do it without using so many critical materials.

This challenging statement discards the fractional horsepower appliances for city apartments and concentrates on the installations for single houses, for the farmer and for industrial requirements, which are the essential ones.

The momentum of such policy will be multiplied by four developments: First, the increasing output of propane as by-product. Second, curtailing consumption of electricity for civilian use. Third, curtailing distribution of electricity (electrification program). Fourth, the invention of the *transitory refrigeration cycle of propane prior to its combustion*.

*Refrigerating Engineering*, July, 1941, carried my report on "Automotive Refrigeration by the Transitory Cycle," and I shall thus not burden the present article with technical details, which are of interest only to refrigeration engineers.

In contrast to "electrical refrigeration" (motor compressor type), "gas refrigeration" (absorption type) and "steam refrigeration" (steam-jet type) I suggest to classify as *automotive refrigeration* a refrigeration system, in which the compressor is driven by a combustion engine; a system, which provides its own motive power. In



this field of automotive refrigeration I pioneered in 1927 this idea:\*

The process of refrigeration which consists in evaporating, compressing and condensing a portion of a body of refrigerant, and utilizing another portion of said body of refrigerant to create motive power to effect said evaporation and compression.

In such a system, the carburetor of the engine is connected to the condenser side of the refrigeration circuit. Fueling the engine with condenser-gas has the great advantage of purging the condenser from non-condensable gases, like air, ethane, methane or the like. This purging feature makes it possible to utilize the commercial grade of propane with all its chemical impurities! A "closed cycle" would require chemically pure propane.

For this double function of refrigerant, or fuel, propane is the ideal substance. Not only is it the best motor fuel (octane rating 125), but it is also the best refrigerant. As such, it had to be "tamed" in one point: its inflammability. You have to be a chemist with his optimistic belief in changing things to carry on and to try to solve such "hopeless" tasks. Finally, in 1938, it was done, by finding the *transitory cycle*.†

#### Lessens Fire Hazard

The transitory cycle reduces the fire hazard of a propane system very nearly to the degree of fire hazard as presented by any standard compression refrigerating system with its lubricating oil. In-

stead of filling large volumes of liquid refrigerant into the receiver tank, as is general practice in "closed cycles", the transitory cycle circulates, so to say, only "a drop" of propane and keeps the supply of refrigerant, or fuel, in the original ICC propane tank. This supply tank is connected to the suction side of the compressor by a fill-up line with a fill-up valve, and this valve opens automatically in response to the level in the receiver.‡ It must be remembered that the propane engine is fueled from the condenser, or receiver, thus lowering the level in the receiver. This fueling line is equipped with a standard LP-Gas regulator, which reduces the condenser pressure of some 200 lbs. to the usual 6 oz. to fuel the carburetor of the propane engine as well as standard LP-Gas appliances.

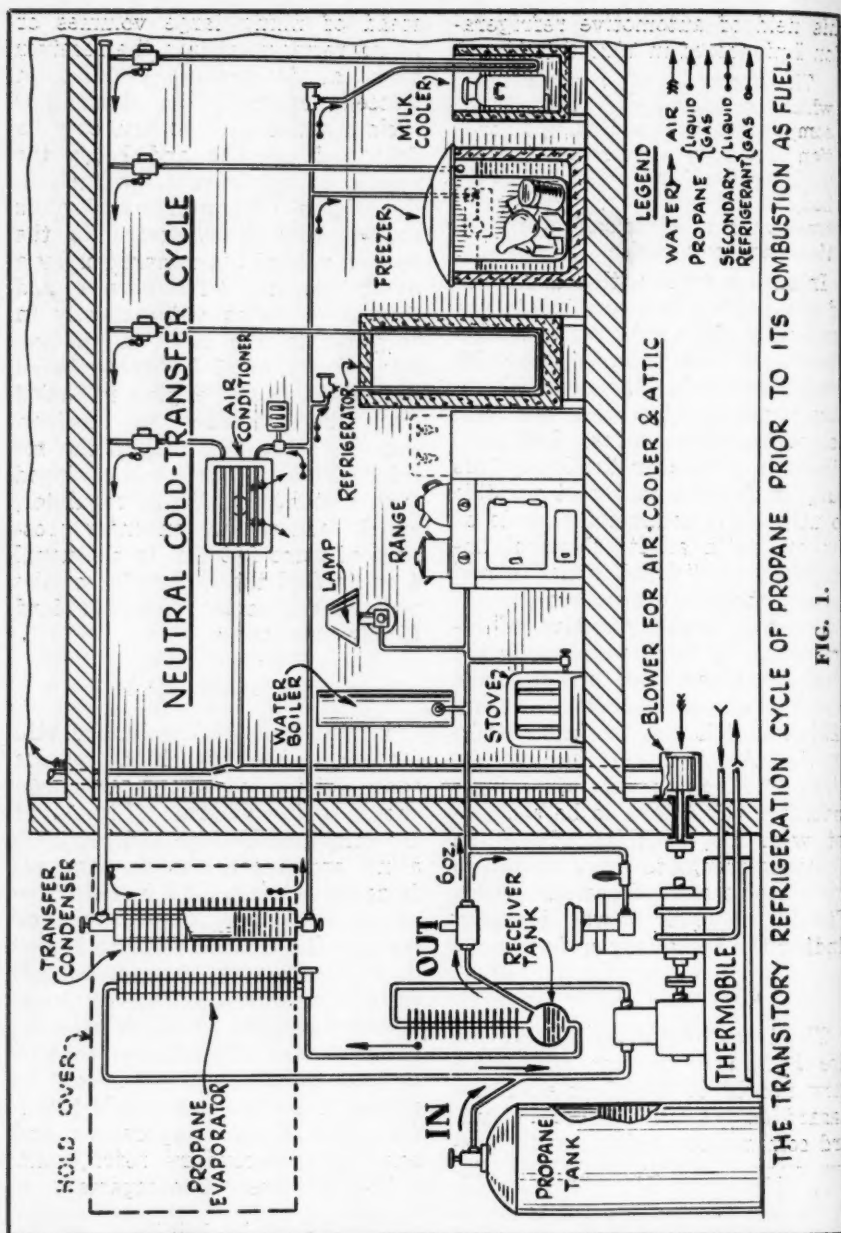
#### Installed Outside the House

To decrease the fire hazard still further, I keep the high-pressure zone outside of the house. As shown in the diagram (Fig. 1) of the combined heating and refrigerating appliances, the propane refrigeration circuit is installed together with the ICC propane tank outside the house. The cold produced by the propane-evaporator is transferred into the house by independent means, which do not involve propane. These means may be a brine-circulation system or, as shown in the drawing, a cold-transfer cycle of an evaporating and condensing secondary refrigerant. Fig. 2 conveys two aspects:

\* U. S. Patent No. 1,935,749.

† U. S. Patent No. 2,195,388.

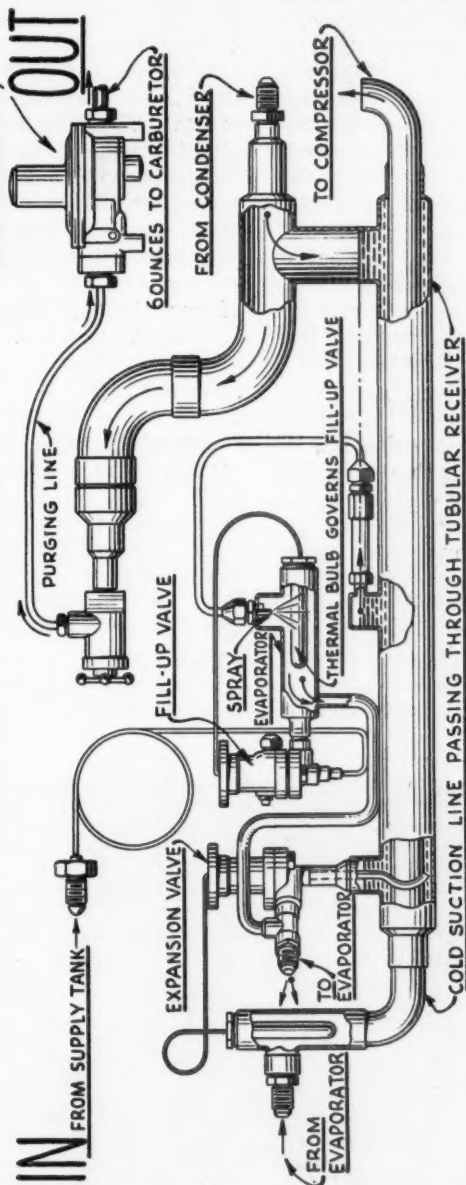
‡ U. S. Patent No. 2,195,387.



# **"THERMOBILE: REFRIGERATION, POWER AND HEAT BY BOTTLED GAS"**

U.S. PATENTS 1,935,749 2,195,387 2,195,388

DR. PETER SCHLUMBOHM



FILL-UP VALVE CLOSING BY COLD-EFFECT OF LIQUID SPRAY TAKEN FROM LEVEL.  
LACK OF LIQUID = CESSATION OF COLD-EFFECT OPENS FILL-UP VALVE.

LEGEND  
LIQUID →  
← GAS  
FIG. 2.

First, it is powerful refrigeration, of any desired B.t.u. capacity and any low temperature, that is made possible by this "Thermobile"-LP-Gas-appliance. Not the housewife's little kitchen refrigerator, but the large jobs are the goal; refrigeration as a tool for the farmer in processing his products; low temperature jobs for powerful quick-freezing and for food-storage; cheap and powerful air-conditioning of a house; those are the things within reach now by this simple refrigerating system.

#### A Source of Profit

Second, to LP-Gas dealers, it should show, that with one stroke the potential volume of LP-Gas appliances, and thereby LP-Gas sales, is doubled, or more. Consumers will pay more for a cold B.t.u. than for a hot B.t.u.! Thus, it will be even more profitable to sell LP-Gas refrigeration appliances than LP-Gas heating appliances.

Where is the ceiling for the pro-

pane price? Would the LP-Gas refrigeration appliances be "cheap" in operation at the present retail LP-Gas prices? I try to give an objective appraisal by computing per ton of refrigeration. A "ton of refrigeration" is the unit in refrigerating engineering. It is the cold-effect of one ton of ice melting in 24 hours. That cold-effect will be produced in dollars and cents for approximately \$3 if you buy a ton of ice; \$10 if you buy eutectic ice; \$20 if you buy  $\frac{1}{2}$  ton of dryice and for the price of 10 gallons of propane as fuel for thermobile! This is the price of refrigeration at the temperature level of ice, (32° F.) The lower the temperature, the more costly the B.t.u. All ice of any kind is actually more costly than quoted above, due to the fact that a surplus supply must be kept to offer sufficient heat-exchange surface with the air, and due to melting or evaporating losses.

It seems to me that up to a gallon price of 45 cents, refrigeration

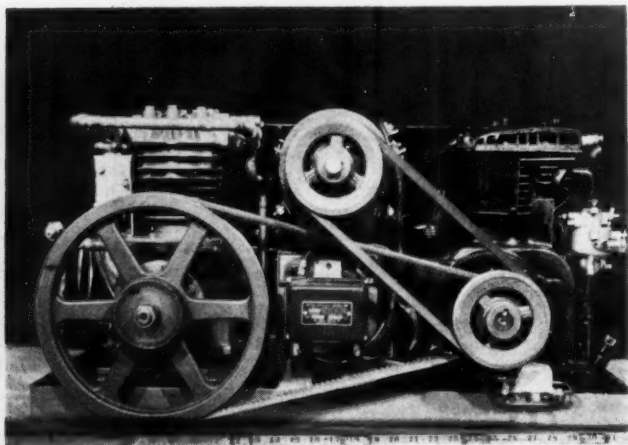


Fig. 3. A complete unit of the "thermobile."

by *thermobile* is cheaper than ice. But then, there is still another angle, which decides all in favor of *thermobile*: To utilize the off-heat of the propane engine, for instance to heat water. Fig. 1 shows the cooling-water pipes of the engine leading into the house.

One might well say, that if the customer has demand for refrigeration as well as for warming water, the *thermobile* will deliver one of the two gratis. There is something for the farmer and for the farmer's daughter.

#### Electrical Marketing Difficult

Marketing electrical refrigeration appliances requires expert knowledge of refrigeration and a staff of service men of special training. Conditioning a "closed cycle" system, filling in the correct

amount of refrigerant, eliminating all air and moisture is "quite a job." The *thermobile* with its open cycle is as simple as an automobile. Pushing the starter-button is all you have to do to fill-up the receiver tank with the correct amount and to purge out the air. Moisture is carried out with the purging.

#### Engineering Experience Helps

Assuming that the LP-Gas dealer and his service staff are familiar with general automotive engineering of a combustion engine and its starting equipment, there should be no difficulty for them to install and to service the *thermobile* as an is shown in Fig. Page 24.

The only control for the transitory cycle is one single, detachable structure including the receiver tank, as shown in the drawing of this "control-bridge."



This 1000-gal. LP-Gas system will furnish fuel for St. Paul's Catholic church in Pocahtontas, Ark., and other customers in the neighborhood, as well.

## Purifying LP-Gases in New Mexico

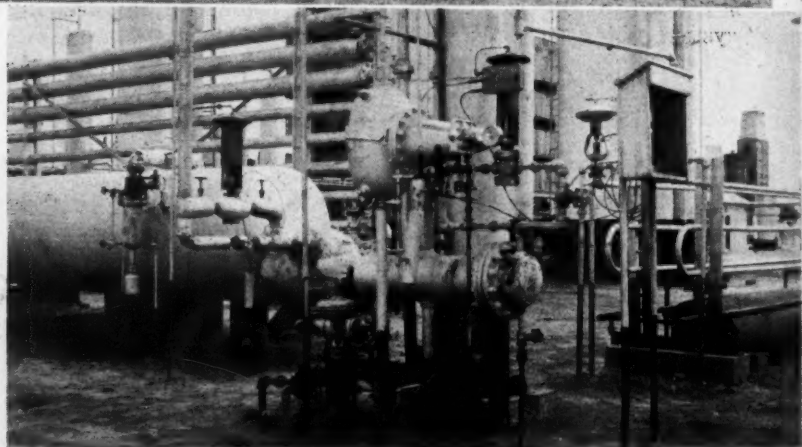
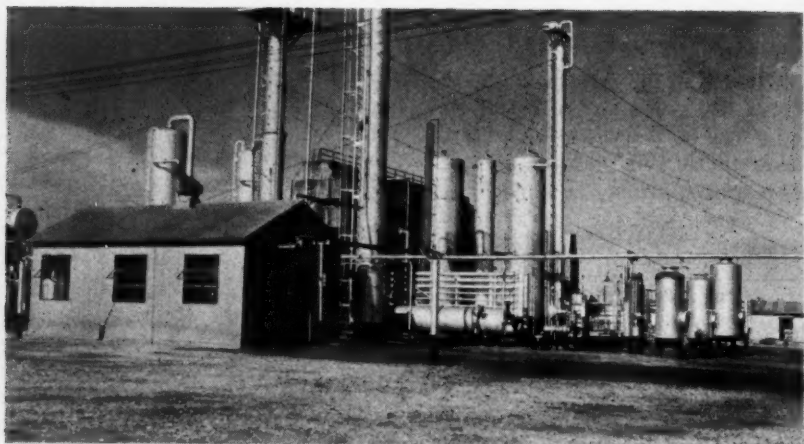


Fig. 1 (top). Fractionation plant of Warren Petroleum Co. in the Monument, N. M., oil field where  $H_2S$  is removed from LP-Gas by fractionation.

Fig. 2 (bottom). Base of LP-Gas fractionator with reboiler and controlling instruments in Warren's plant in New Mexico.



# Hydrogen Sulphide Removed From LP-Gas by Fractionation

By J. C. ALBRIGHT

**M**OST operators of plants which manufacture liquefied petroleum gases that contain large quantities of  $H_2S$  (hydrogen sulphide) have been able to remove this sulfur compound only at excessive cost when the conventional methods are employed for treating the product. When LP-Gas is cut from a natural gasoline which is produced from a high sulfur gas, the amount of  $H_2S$  in the raw material before stabilization is frequently as high as 2000 grains per gallon. On the other hand, there are localities where both natural gasoline and LP-Gas are manufactured which do not contain even a trace of sulfur. Southeastern New Mexico in particular, and the Permian Basin in general, are areas where hydrogen sulfide must be removed from all classes of liquefied products before they can be marketed.

## $H_2S$ Must Be Removed

When stabilizing of fractionating raw natural gasoline to a low RVP (Reid Vapor Pressure) a large percentage of the  $H_2S$  is driven overhead with the low boiling fractions from the column being operated. If the overhead vapors from the stabilizer are liquefied and saved for ultimate conversion to LP-Gas of standard RVP specifications, the  $H_2S$  must be removed. In most cases this is accomplished with sodium hydroxide ( $NaOH$ ) in

an aqueous solution contacted intimately with the LP-Gas in a closed circuit, but, because of the extremely large quantities of chemicals which are necessary to reduce the sulfur compound from the product, the cost frequently is above the economic limit.

A natural gasoline plant operating in Southeastern New Mexico (Fig. 1) produces an average of about 7500 gals. of overhead vapors from the natural gasoline stabilizer which, if free from  $H_2S$ , could be reduced conveniently to excellent LP-Gas at a nominal cost. The engineering division of the company operating this gasoline plant observed that, while fractionating the raw natural gasoline to a product having a comparatively low RVP—about 14 lbs.—most of the  $H_2S$  was separated from the commodity and passed overhead with the discard vapors. Assuming that the  $H_2S$  could also be separated from the overhead discard, if subjected to subsequent fractionation, an auxiliary plant was designed to treat the raw LP-Gas for the removal of the sulfur compound.

● This article describes a new technical development in the purification of liquefied gases. It illustrates how one producer was able to use a source of liquefied gases which previously might be discarded due to excessive cost of purification.—Ed.

The liquefied overhead discard from the gasoline fractionator contains an average of 2000 grains of  $H_2S$  per gallon, and has an end point of 25/26° F. A special fractionator (Fig. 2) was designed which has an OD of 13 in., and a height of 30 ft., fitted with 15 fractionating plates, each equipped with three bubble caps. Since a quantity of the gasoline stabilizer overhead was required for column control by pumping the liquefied vapors back to the gasoline tower, only a small addition was required for complete liquid recovery of the discard vapors. This liquid is pumped at the rate of manufacture to the special column with close

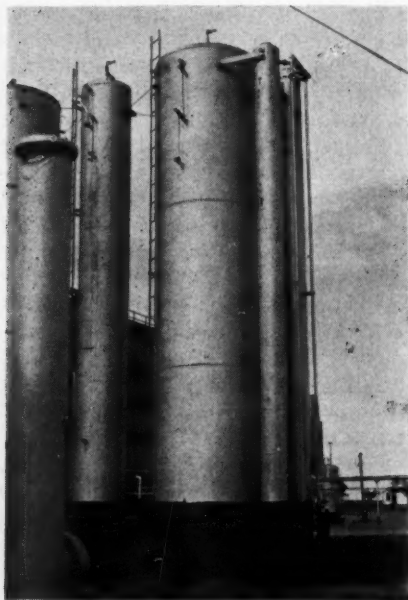


Fig. 3. Treating columns where LP-Gas is washed with caustic solution after fractionation to remove residual quantity of  $H_2S$  remaining in fractionated product.

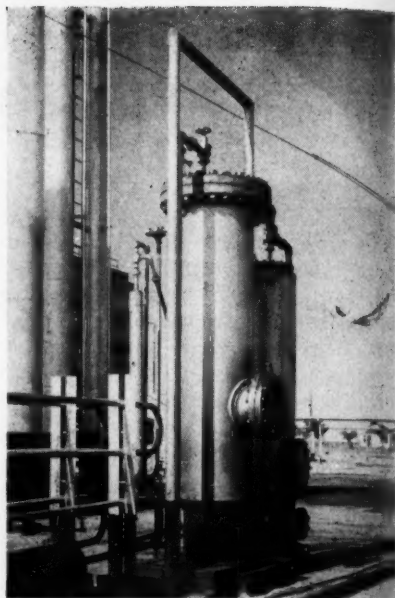


Fig. 4. Perco contact drum in which copper sweetener is placed for converting mercaptans to disulfides to sweeten LP-Gas after  $H_2S$  removal.

clearance pumps through heat exchangers at a processing pressure of 300 lbs. per sq. in.

A steam heated reboiler (Fig. 2) at the base of the column is held at a temperature of 214/216° F., and the top of the column regulated as to temperature by controlling the required quantity of liquid reflux to obtain the desired base product with a marketable RVP, and to eliminate a maximum percentage of  $H_2S$ . With an average daily charge of 7500 gals. of raw, high sulfur content stabilizer overhead discard, a product is being obtained which contains an average of from 60 to 100 grains of  $H_2S$  per gallon, at a commodity loss

of only about 2000 gals. per day, most of which would be discarded in any event to produce a standard RVP of the finished LP-Gas.

The removal of 100 grains of H<sub>2</sub>S from any petroleum product is much more simple than when the commodity contains as much as 2000 grains per gallon. In this case, the fractionated LP-Gas, cut to standard RVP specifications in the special fractionating column, is subsequently subjected to two treat-

ing phases. The first is with a standard caustic solution (Fig. 3) where the commodity and the chemical are intimately mixed through a series of contactors, followed by separating vessels to permit the caustic solution to settle entirely from the products. The second treatment is with a copper sweetener (Fig. 4) to convert the mercaptans to disulfides so that the finished LP-Gas will be sweet and non-corrosive.

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### **Protane Corp., Erie, Pa., Buys Assets of American Gas Service**

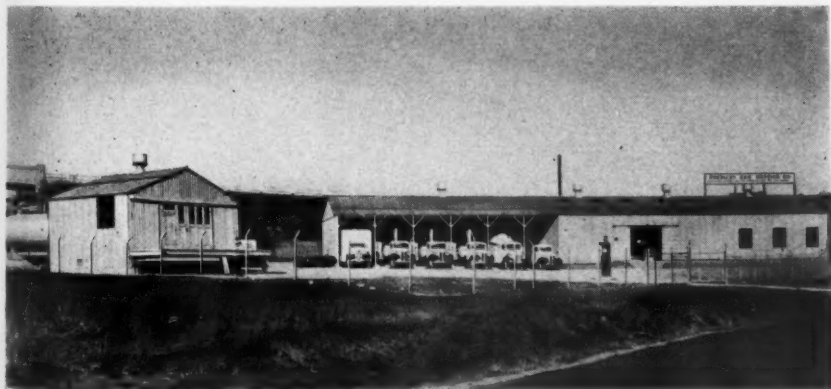
The assets of the American Gas Service Co., a subsidiary of the Blaw-Knox Steel Corp., Pittsburgh, Pa., have been purchased by The Protane Corp., Erie, Pa., it was announced recently. A photo of one of the plants is shown on this page.

The American Gas Service Co. is one of the largest companies of its type in the United States. It oper-

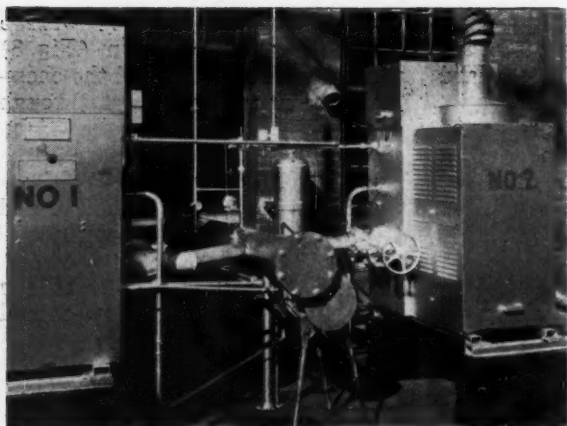
ates 14 district offices, each having complete facilities for fuel storage, sales, service and installation work.

These districts cover Maryland, Delaware, the District of Columbia, Virginia, West Virginia, Ohio, Michigan, New Jersey, Kentucky, Indiana, Illinois and Wisconsin.

Protane Corp. officials state that substantially the entire personnel of the American Gas Service Co. will remain with the new management.



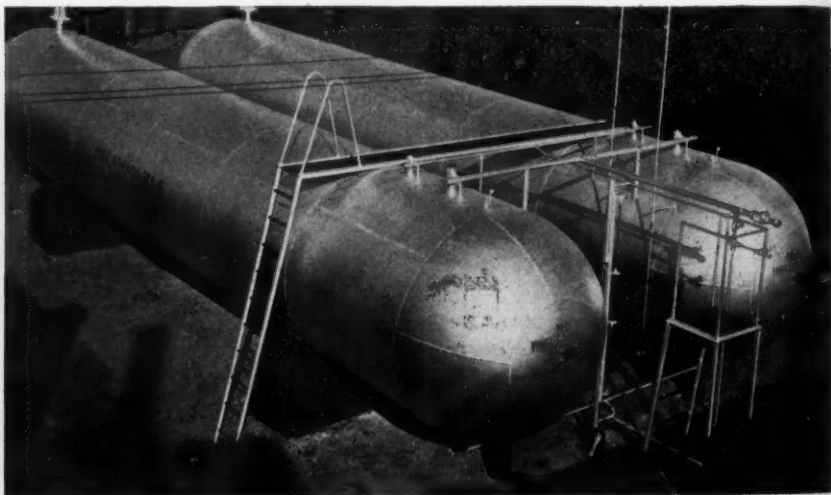
One of the plants of the American Gas Service Co.



## Idaho's Capitol City Has New Butane-Air Plant

**ABOVE:** After 35 years of 500 B.t.u. manufactured gas, the city of Boise, Idaho, is now being served by a 1000 B.t.u. butane-air plant. Here are shown the gas-air mixing machines which serve 2000 meters in a city having a population of 26,000. Each machine is a complete gas-making unit equipped with a gas-fired heat exchanger, pressure regulators, heat regulators and an inspirator type mixer; also includes automatic controls for convenience and safety in operation. Duplicate units are considered desirable for public utility service. These units are specially designed for installation out-of-doors.

**BELOW** are the butane storage tanks, each of 15,000 gals. capacity. The interesting features of this installation include: (1) The placement of relief valve vents at points remote from hand valves or other controls. (2) Vents from relief valves are turned down to prevent entrance of rain water. (3) Convenient walkways and platforms are provided for the operators of valves and tank gaging devices. (4) The desirable arrangement of only two supporting piers for each storage tank.



# Industry Hits New Highs in '41

By G. G. OBERFELL

Vice President, Phillips Petroleum Co., Bartlesville, Oklahoma

THE year 1941\* was a most unusual one for the liquefied petroleum gas industry—a year which made new highs in marketed production for all types of uses in spite of (a) the difficulty in obtaining materials or new installations, (b) curtailment of sales activities in many quarters because of inability to secure customer equipment and appliances and (c) restrictions on appliance financing. It was a year which saw a great increase in the industrial uses of liquefied gases in defense work and an increase in the amounts of certain associated hydrocarbons used in the manufacture of synthetic rubber and plastics.



G. G. OBERFELL

Table I shows the estimated marketed production of liquefied petroleum gas during 1941 as 445,000,000 gals., compared with 313,456,000 gals. for 1940, or an increase of 42%.

Table I "Total Sales" for all years except 1941 were obtained from U. S. Bureau of Mines report. "Distribution" for the years 1931 to 1940 inclusive was obtained

from the same source. All other volumes are estimated by the writer. Total sales volumes include all liquefied petroleum gas (propane, butane-propane mixtures, and pentane) when sold as such.

The estimated domestic use of liquefied petroleum gas in 1941 amounts to 221,880,000 gals., an increase of 65.5% over 1940 when 134,018,000 gals. (42.7%) were so consumed. On the basis of the most reliable information available to the writer, the number of new domestic users of liquefied petroleum gas increased approximately 520,000 during the year. It is now estimated that there are a total of 1,645,000 users of liquefied petroleum gas in the domestic and small commercial classifications—a growth due largely to increasing public acceptance of liquefied petroleum gas as an ideal domestic and commercial fuel. Doubtless many additional thousands of domestic and commercial consumers could have been secured in 1941, had it been possible for the marketers, their distributors and dealers to secure the necessary appliances and equipment with which to make additional installations.

Many new industrial installations were made, principally in the heavy manufacturing areas in the North and East, and a majority use propane, delivered in tank car quantities. There was little diffi-

\* Abstracted by BUTANE-PROPANE News.

TABLE 1. MARKETED PRODUCTION OF LIQUEFIED PETROLEUM GAS

Year	TOTAL SALES		Distribution—Gallons per Year		Per Cent Increase Over Previous Year	Industrial and Miscellaneous	Per Cent Increase Over Previous Year	Gas Manufacturing	Per Cent Increase Over Previous Year
	Gallons Per Year	Per Cent Increase Over Previous Year	Domestic	Per Cent Increase Over Previous Year					
1922	222,641	...	Sale of liquefied petroleum gas confined primarily to bottled gas business prior to 1928		...	400,000	...	1,500,000	...
1923	276,863	24.4			...	1,500,000	275.0	2,500,000	66.7
1924	376,488	36.0			100.0	2,200,000	46.7	4,000,000	60.0
1925	403,674	7.2			29.6	7,171,686	226.0	6,303,242	57.6
1926	465,085	15.2			6.2	8,167,194	13.9	9,703,470	53.9
1927	1,091,005	134.6	2,600,000	...	2.3	13,987,095	71.3	8,318,325	14.3
1928	4,522,899	314.6	5,900,000	126.9	6.3	32,448,000	132.0	6,298,000	24.3
1929	9,930,964	119.6	11,800,000	100.0	20.9	47,894,000	47.6	7,581,000	20.4
1930	18,017,347	81.4	15,294,648	29.6	40.4	67,267,000	40.5	9,371,000	23.6
1931	28,769,576	59.7	16,244,103	6.2	36.0	89,402,000	32.9	11,175,000	19.3
1932	34,114,767	18.6	16,625,588	2.3	41.7	94,983,000	6.2	12,386,000	9.8
1933	38,931,008	14.1	17,681,000	6.3	51.3	120,615,000	27.0	15,435,000	24.6
1934	56,427,000	44.9	21,380,000	20.9	53.1	159,153,000	32.0	20,285,000	31.4
1935	76,855,000	36.2	30,014,000	40.4	65.5	193,456,000	21.4	29,644,000	46.1
1936	106,652,000	38.8	40,823,000	36.0					
1937	141,400,000	32.7	57,832,000	41.7					
1938	165,201,000	16.7	87,530,000	51.3					
1939	223,580,000	35.3	134,018,000	53.1					
1940	313,456,000	40.2	221,880,000	65.5					
1941	445,000,000	42.0							



culty in installing these systems since nearly all of the plants were in defense work, and carried high priorities for equipment. From these installations, liquefied petroleum gas is used in the manufacture of battleships, machine guns, tanks, hydraulic pumps, aluminum shapes, shells, airplane parts, cruisers, destroyers, tankers and ordnance of all types. Due to heavy demands being placed on regular utilities, many large industrial concerns have installed liquefied petroleum gas systems as standby to insure gas service for vital manufacturing operations during periods when the utility system has high peak loads.

Liquefied petroleum gas systems have been installed to furnish piped gas service for several large housing projects in defense areas. The gas is delivered to some of the plants via tank car and to others via tank truck. One very large utility installation is being completed in an Ontario city, where normal requirements are met with natural gas. The liquefied petroleum gas is to be used to supplement oil-gas for standby and peak load control. Over 200 cities are now employing or arranging to use undiluted butane or propane, propane-air, butane-air, propane, butane, or mixtures for the sole source of gas or for standby, peak load control, or enrichment.

Increasing quantities of liquefied petroleum gas were transported direct from gasoline plants or refineries to consumers, or from pipeline terminals to consumers in 1941.

In the chemical field, liquefied petroleum gases became an increas-

ingly important source of raw material. Volume shipments of special grades of propane, normal butane, isobutane, and butadiene were made for use in the manufacture of nitro-paraffins, plastics, and synthetic rubber. For experimental and pilot plant operations such special hydrocarbons as propylene, butylene, isobutylene, and others are now available in pure and technical grades.

Competition for the domestic markets continues keen from both within and without the industry, electricity being the principal competitor from without the industry for this large potential domestic consumer market. Prices within the industry have, in general, strengthened, particularly in the Southwest.

#### New Uses Developed

In addition to increasing volumes absorbed in present markets during 1941, new uses began to require appreciable volumes of hydrocarbons in the liquefied gas range. Among these were butadiene and isoheptene for manufacturing synthetic rubber, diolefins for plastics, propane for nitro-paraffins, and normal butane for conversion into isobutane in the manufacture of aviation gasoline by the isomerization and alkylation processes.

The year 1941 saw the first large scale installation of propane-fired heaters for removing accumulations of ice and snow on switches in railroad yards. The installation was made after limited trial operations during the winters of 1939-40 and 1940-41.

Additional special high-pressure tank cars and transport trucks were

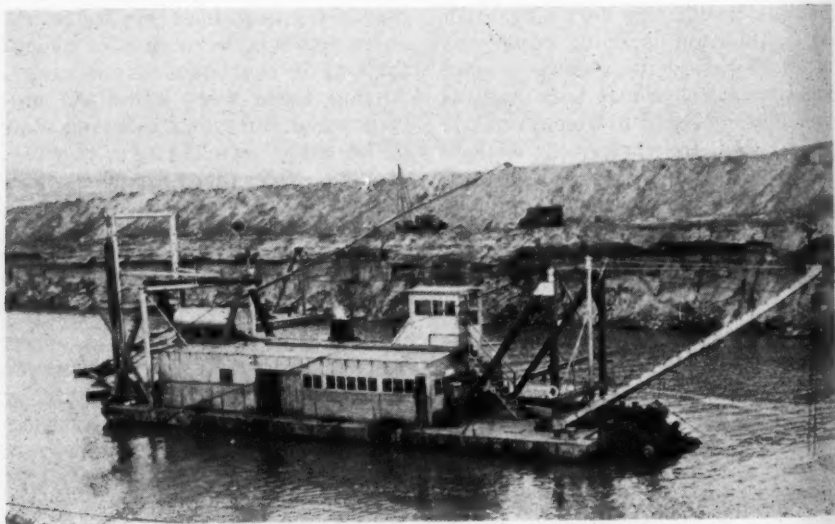
required to deliver the increased volumes in 1941. It is estimated that orders for more than 200 new tank cars were placed with car-builders in 1941. All tank cars ordered have not been delivered, due to defense demands for heavy steel plates, which accounts for some increased transportation by tank trucks, especially in the areas where relatively short hauls are involved. Arrangements have been made by one marketer to transport large volumes of butane from Texas to many industrial users in a large mid-western city (a distance of about 1100 miles), by a combination of pipeline and by transport truck.

Certain marketers, realizing the importance of safety in the design, installation, and operation of liquefied petroleum gas equipment, have placed increased emphasis on this

phase of the business. Safety meetings for operating personnel were made a regular procedure in some instances. Safety meetings also were held by marketers for their dealers.

Twenty-seven states have enacted laws requiring payment of motor fuel taxes on only those quantities of liquefied petroleum gas sold or used to propel motor vehicles upon the public highway.

In 1941 additional states adopted rules and regulations governing the safe storage, handling, transportation, and utilization of liquefied petroleum gas. A large percentage of these regulations were in substantial conformity with the National Board of Fire Underwriters' standards. These states now have liquefied petroleum gas rules and regulations: New Mexico, Oklahoma, California, Kansas, Arkansas, In-

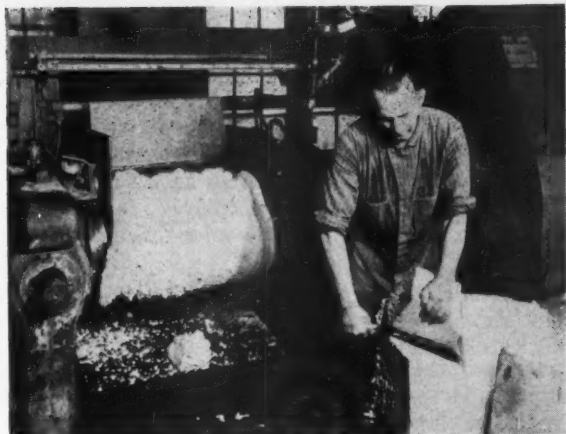


A dredge powered by liquefied gas fueled engines.

▼

Manufacturing synthetic rubber made from components of liquefied petroleum gas.

▼



diana, Michigan, South Dakota, Minnesota, Louisiana, Texas, Alabama, Kentucky, Tennessee, Iowa, Mississippi and Wisconsin.

The close cooperation between the industry and the various national, state and local regulatory and insurance bureaus and associations has resulted in the desirable and widespread establishment of uniform rules and regulations.

As the year 1941 ended, the liquefied petroleum gas industry found itself in a most difficult position from the standpoint of obtaining equipment with which to make new customer installations in 1942. During the latter part of 1941, several marketers of domestic systems had placed their dealers on an allocation basis, allowing them only a certain percentage of 1940 system and appliance sales. Copper aluminum, zinc, synthetic rubber, steel and other metals have been widely used in liquefied petroleum gas systems and appliances, and, of course, all are critical materials.

However, certain leading mar-

keters and equipment manufacturers have spent considerable time on research work connected with development and use of substitute or alternate materials and equipment with noteworthy success. These efforts are being continued.

In view of restricted output and difficulty in obtaining necessary materials under war conditions, appliance manufacturers are working to eliminate or reduce the use of aluminum, chromium, and other critical materials and will undoubtedly reduce the number of models manufactured in 1942.

It appears that approximately as many new appliances will be obtainable as the number of new systems, including cylinders, which can be spared from war needs.

Federal regulations effective Sept. 1, 1941, governing credit terms have naturally affected the financing of appliances to the liquefied petroleum gas industry and its customers to some degree, but these restrictions have not been detrimental, and all appliances available in

1941 were sold regardless of these restrictions.

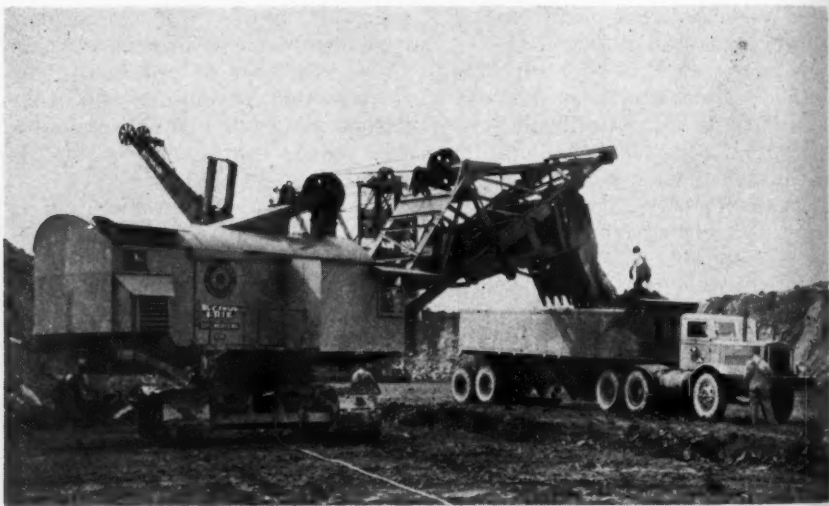
Production facilities continue to expand at both refineries and natural gasoline plants, with the major output of the latter flowing into motor or aviation fuel channels as raw material for blending, polymerization, alkylation and isomerization.

The demands for tremendous quantities of aviation gasoline under the war program has greatly stimulated the installation of new large capacity isomerization and alkylation plants, and plans for further expansion along these lines throughout the petroleum industry are well under way.

It is still too early to estimate the volume of normal and isobutane to be required for the manufacture of aviation gasoline; however, it is reasonable to assume that large quantities heretofore available to

the liquefied petroleum gas industry will soon go into aviation gasoline channels. Consequently, those marketers who have had a policy of marketing propane or furnishing storage and utilization equipment suitable for the use of propane are in a preferred position, and their customers will be better able to obtain liquefied petroleum gas in years to come.

This growing, young industry can well be proud of its 1941 record, for it enabled many thousands of American families and hundreds of commercial establishments to have the convenience of gas service for cooking, water heating and refrigeration. Liquefied petroleum gas has also greatly aided in the manufacture of both civilian and vital defense articles, and will play an increasingly important role as the war production program progresses.



Strip mining coal. LP-Gas fueled dump truck.

# Oklahoma School Authorities Put LP-Gas at Head of Class

By O. D. HALL

**A**RAPIDLY increasing number of Oklahoma schools, located beyond natural gas mains, are enjoying the convenient, healthful and highly efficient heating qualities of liquefied petroleum gas.

Five years ago there were few LP-Gas installations in Oklahoma schools. But now, according to Roy Templeton, an assistant to State Fire Marshal Carl C. Garner, from 35% to 40% of the rural schools in Oklahoma are utilizing butane, propane or mixtures of the two, for heating and other purposes. LP-Gas installations also are found in many of the school buildings serving the smaller towns of the state which do not have natural gas distribution systems.

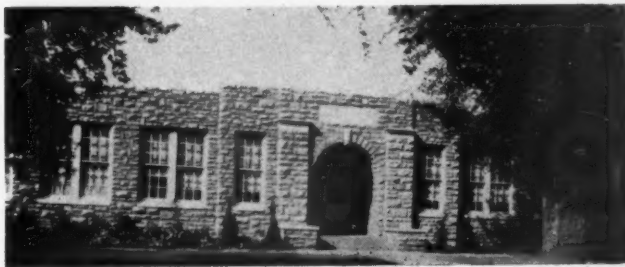
One of the pioneers among small cities, or towns, utilizing liquefied petroleum gas is the Lexington, Okla., grade and high school, with an average attendance of 385, and serving 80 square miles of territory.

There butane was introduced

about five years ago for heating a combination auditorium and gymnasium. The school officials have been so highly pleased with the fuel that it is now supplying 100% of the heating requirements of three of the four buildings in the school plant. In the original building, now serving as a high school, a coal furnace still survives but butane stoves have been introduced into office rooms of that structure. School board members plan to replace the furnace entirely with LP-Gas equipment as soon as the district can afford it.

The original installations in the 60 ft. x 100 ft. auditorium-gymnasium building were made by Sims and Sims, of Oklahoma City, Okla. In this building are two thermostatically controlled, blower-type suspended butane heaters, each having a rated capacity of 225,000 B.t.u.'s.

The new Greenfield consolidated school shown here has a modern butane gas system, recently installed.



Just back of the stage in this building is a battery of butane gas burners topped by several ovens. This equipment cooks the noonday meals for pupils of the school who are served from tables placed on the stage. In the basement, under the stage, is a 100-gal. water heater. This not only heats an abundance of water for the boys' and girls' dressing rooms and showers, but furnishes hot water for cooking, dish washing and all cleaning operations.

In all, there are 28 butane heating appliances in the four buildings of the Lexington school plant. Two 30,000 B.t.u. butane heaters are placed in each of the eight rooms of the grade school building, just west of the auditorium-gymnasium. Space heaters of 40,000 B.t.u. capacity supply butane heat for the Future Farmers of America building, where vocational agriculture is taught, while other stoves of the same type as found in the grade school rooms heat offices in the various buildings. Some of the heaters were installed by Murle DeLong, Noble, Okla.

E. C. Harwick, chairman of the board of education of the Lexington schools, expressed entire satisfaction with the butane system.

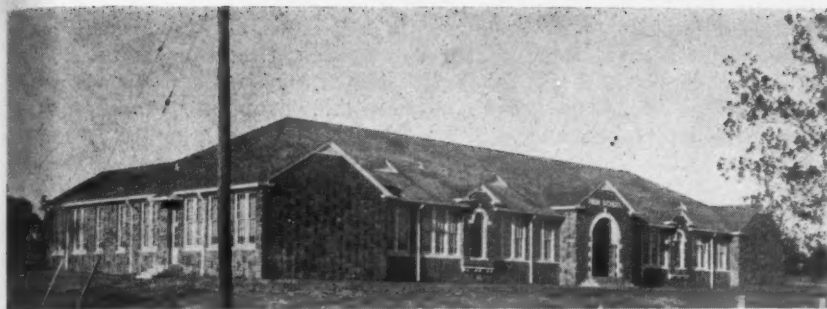
"It costs us about \$100 a year to operate our coal furnace, which supplies about one-fourth of our heating needs, while fuel for the butane equipment, which supplies three-fourths of our heating requirements, costs us only about \$250 per year," Mr. Harwick said. "Our butane service not only is more economical but gives us a much more even and easily regulated heat. I consider our service as good as we could get from natural gas, which is not available in our town. The most important thing we have learned in five years' experience is to install enough appliances to meet maximum heating needs."

Superintendent C. B. Howerton said: "We have trouble-free service from our butane equipment. After the janitor turns on the stoves in the morning the teachers in each room can regulate the stoves, leaving the janitor free for other duties."



The 218-gal., metered propane gas service tank, Soldier Creek school.





A fine example of modern school buildings now found in smaller Oklahoma towns. This one, completed during 1941 at Fort Gibson, is entirely heated by two butane gas furnaces.

The Lexington butane service is supplied from a 100-gal. tank buried the regulation distance from the nearest building and installed by Sims and Sims.

The Sparks grade and high school, in Lincoln county, is 100% equipped with a propane gas heating system, installed by the American Butane Gas Co., Oklahoma City, Okla.

The eight rooms of this school are heated by nine circulators with a total capacity of 360,000 B.t.u.'s. Two aboveground propane tanks, having 218 gals. water capacity each, supply the fuel through a piping system looped around the building five feet outside the walls. Each appliance is connected with this loop through  $\frac{3}{4}$ -in. pipe leading directly to  $\frac{1}{2}$ -in. risers connected to the burners.

The stoves are owned by the school and the tanks are owned by the American Butane Gas Co., and furnished on a leasing basis. The twin tanks are tied together with a Fisher regulator set with one inch water column differential so as to automatically switch on the

second tank when fuel in the other reaches a low point.

Here again was found a satisfied board of education, composed of J. A. Gatlin, director; Albert S. Costner, clerk, and J. E. Wright, member. Mr. Costner said: "We prefer propane gas because it is so much cleaner than coal which we formerly used. It saves a lot of work and expense in repainting and cleaning our building. It also has enabled us to employ a janitor for less money than we paid when the work of this employe was heavier because of the coal equipment."

As against Mr. Costner's estimate of \$33 per school month as average cost of coal, figures obtained from J. L. Grigsby, president of the American Butane Gas Co., show that the propane fuel cost averaged \$23.75 per month for the period from August 31, 1940, to April 22, 1941.

One of the most recent installations of modern butane equipment also was made by Sims and Sims in the new high school building at Fort Gibson, Okla., a town of

about 1200 population in Muskogee county. Two Security Manufacturing Co. butane furnaces, of 200,000 B.t.u.'s capacity, each, were installed in September and put in operation with the first chill autumn days.

These furnaces are placed near the center of the building and are thermostatically controlled. They are set on top of the concrete floor. Each is provided with a squirrel-type fan and a  $\frac{1}{2}$ -hp. electric motor, all a part of the unit. This equipment forces hot air through ducts concealed in the walls and attic. These ducts are connected to 21 registers. Through damper controls at each register the heat may be directed to each room or shut off entirely from the class rooms and diverted into the auditorium when the latter is in use and the class rooms are not occupied. There are 16 rooms in the building, all of which not only are adequately heated, but provided with circulating air entirely free of fumes or other unhealthful substances.

"A test we made in one room on

a hot day, through operating the air circulating fans alone, demonstrated that we can secure a perceptible drop in temperature if desired in the summer by use of the air circulating part of the system," said J. S. Teel, principal of the Fort Gibson high school.

C. M. Johnson is superintendent. Members of the board of education are: Ewell A. Boatright, president; R. E. Coleman, clerk, and Link Johnson, member. The high school serves Joint District No. 3 and the average attendance is 162.

The fuel is supplied through an 1100-gal. butane tank and a piping system looped about the building and connected directly to the furnaces, so as to eliminate the necessity of a network of pipes under the building.

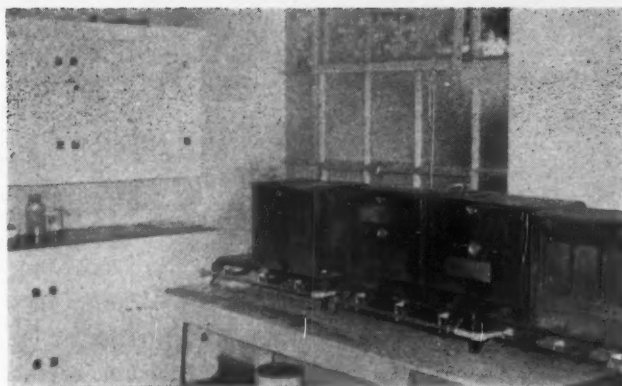
LP-Gas has also replaced other fuels in the Story school, District No. 6, of Garvin county, Okla.

The Story school serves one of the richest rural school districts of the state, which secures an abundant share of taxes from three oil lines, one gas line and one railroad traversing the district.



The Story school building, one of the finest found in Oklahoma rural districts. Butane does a 100% heating job here and is also used for the principal's residence, partially shown in the upper left background.

A row of butane gas burners and ovens in kitchen of the Lexington, Okla., school auditorium-gymnasium upon which are prepared daily luncheons for 385 pupils.



An attractive gray brick school building, erected in 1940, and including two classrooms and an auditorium, are entirely heated with butane circulating heaters.

A 540-gal. butane tank, connected to 325 ft. of  $1\frac{1}{4}$ -in. pipe looped around the building, four feet distant from the walls, with leads of  $\frac{3}{4}$ -in. pipe directly to the appliances, supplies fuel for the school building and the principal's home. Four Temco circulating heaters, of 60,000 B.t.u.'s capacity, each, heat the classrooms and auditorium. Two of these heaters are in the auditorium and one in each of the classrooms. All stoves are vented with 4-in. pipe and the two in the auditorium are provided with electrically operated fans.

The school district owns a cottage on the grounds furnished as living quarters for Principal J. C. Carlton, who is now serving his 15th year with the school. There is a 30,000 B.t.u.'s Temco space heater in each living room of the principal's home. The kitchen is provided with a butane range. All installations at the Story school

were made by the Oklahoma Butane Gas Co., Oklahoma City, and were completed in January of last year.

Members of the board of education of the Story school district are: Roy E. Price, president; O. L. Ledgerwood, clerk, and W. L. Pesterfield, member. Principal Carlton is enthusiastically in favor of the LP-Gas service, as compared with coal, the fuel used for many years.

"Our fuel costs not only are much lower," he declared, "but we no longer are bothered with smoke or fumes. Since I do the janitor work, in addition to my teaching duties, I know that I have far less cleaning to do and practically no work at all in keeping a surplus of heat always available."

A rural school, where propane gas is giving 100% trouble-free service, is located about six miles east of Oklahoma City. It is known as the Soldier Creek school, District No. 51. Here six 40,000-B.t.u. circulating heaters and one 4-burner propane gas range carry the heating and cooking load. Two

218-gal. propane tanks, equipped with a Fisher regulator and American meter, supply the propane storage capacity. The tanks are owned by the American Butane Gas Co. and the fuel is sold on a metered basis.

Since the propane system was installed in September, 1939, fuel costs per stove have averaged about \$1.75 each month, compared with about \$3.25 per month per stove for coal. Fuel costs on a flat basis are not easily compared because the building has been enlarged and equipment added since propane replaced coal.

E. A. Ervin, a former member of the board when coal was burned, and Jack Conner, director of the board, talked freely about the advantages of the propane gas service. They expressed pleasure that their fuel bills were much less and that there had been sufficient warmth in each room at all times, even during the coldest winter days, to keep all the pupils comfortable. They stated that before LP-Gas was installed it was some-

times necessary to dismiss school during low temperatures.

In this school, where a few parents of pupils are WPA workers, the school district joins with the WPA on a 50-50 basis in bearing the costs of serving free noonday lunches to all the pupils. The propane gas range furnishes fast, clean heat for this purpose.

The Hughes Radio and Electric Co., of Erick and Hollis, local dealers for the Oklahoma Automatic Gas Co., of Oklahoma City, about a year ago installed 22 Moore circulating heaters in the Ronn school, of Harmon county. Capacities of these heaters range from 30,000 to 75,000 B.t.u.'s each. A 1000-gal. Oklahoma Automatic Gas Co. butane tank was installed there.

Another butane system was placed in the Hillsdale consolidated school, Garfield county, last year. The system includes two Oklahoma Automatic Gas Co. storage tanks and 15 Moore circulating heaters with total capacity of 550,000 B.t.u.'s. The building is circled by 450 ft.



In this room, turned over to the "Future Farmers of America," vocational agriculture and dairying are taught to pupils of the Lexington, Okla., school. Note butane heater at left lower corner.

Front view of the Sparks, Okla., high school and grade building. Every room is heated with propane gas.



of 2-in. pipe with  $\frac{3}{4}$ -in. leads to the appliances. A 20-gal. water heater furnishes hot water for the school laboratory.

Butane Consolidated, LP-Gas dealers of Oklahoma City, reports the installation of a 1000-gal. butane tank system, equipped with heat exchanger, in the Oakwood consolidated school, Dewey county.

Installations in the Oakwood school include a 20-gal. water heater, two suspended thermostatically-controlled Reznor Manufacturing Co. unit heaters, of 150,000 B.t.u.'s capacity each, and 30 Tennessee Enamel Mfg. Co., Temco circulating heaters of from 30,000 to 40,000 B.t.u.'s each, according to W. L. Elkin, of Butane Consolidated.

This company also installed a modern butane gas system in the Greenfield consolidated school, district No. 7, of Blaine county. This plant includes one 1100-gal. supply tank, equipped with pit coil heat exchanger made to carry a load of 1,000,000 B.t.u.'s per hour. The tank is set on a solid brick foundation. The coils are placed in a space between the foundation and

the bottom of the supply tank. They are connected to a 20-gal. Day and Night water heater and a Minneapolis-Honeywell circulating pump.

This butane system is connected to a mercury switch at the supply tank. When the pressure on the tank gets below six pounds, the mercury switch automatically starts the circulating pump, which circulates hot water in the pit coil from the water heater. After the hot water raises the pressure in the supply tank to 15 pounds it automatically shuts off the mercury switch, which stops the circulation of the hot water until a need for further pressure build-up occurs.

The Greenfield school butane system supplies fuel to 31 Clow-Gasteam radiators, 24 in the main building and seven in the auxiliary building.

The same company, last year, installed one 10-hp. boiler and a 15-hp. boiler in the Northeastern State Teachers' College at Tahlequah. One 1000-gal. butane tank and a 500-gal. tank were placed to take care of a potential 1,500,000 B.t.u.'s heating load.

# SELLING

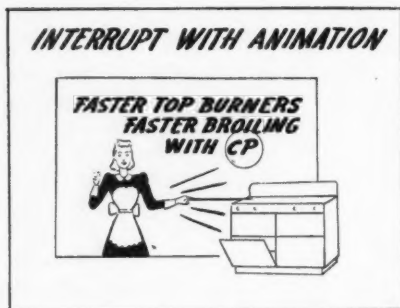
**G**OOD appliance display which sells merchandise is largely a matter of following a few simple rules of arrangement and presentation that result in focused attention and directed emphasis.

Last month similar sketches underlined the necessity for telling your story quickly and briefly, for concentrating interest on one item at a time, for steering the custom-

er's eye to the merchandise, for isolating a single piece of merchandise to dramatize it, for keeping merchandise accessible, and for varying appeals.

These sketches and those published in the January BUTANE-PROPANE News were originally used to illustrate a talk by Homer Laughlin, Jr., Southern California Gas Co., Los Angeles.

## INTERRUPT WITH ANIMATION



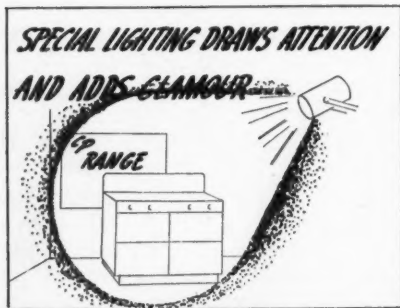
Reverse the inaction of a cat at a mouse hole, and you have it.

## IF YOU MUST SAY A LOT SUBORDINATE SOME MESSAGES



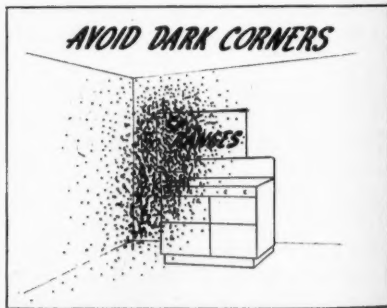
Stress the most important ideas, and merely mention the lesser.

## SPECIAL LIGHTING DRAWS ATTENTION AND ADDS GLAMOUR



The spot light is as effective in your store as in the theatre.

## AVOID DARK CORNERS



Don't hide the light of your merchandise under a bushel basket.

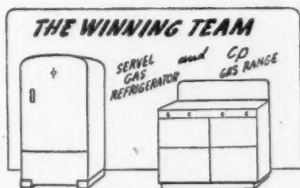


## FEATURE BENEFITS TO CONSUMER



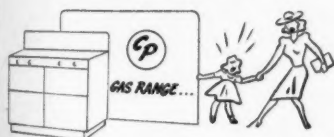
What it does, not how it's done, is most important to the customer.

## TIE IN COMPANION PIECES



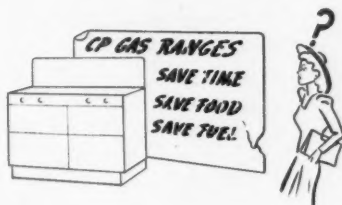
Once in awhile a double feature is good showmanship in display.

## BUILD SOLIDLY (YOUR DISPLAY WILL NEED IT)



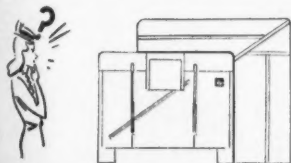
Your displays will have to take it. Make 'em tough and strong.

## POLICE 'EM OFTEN



Like your salesmen, displays should be shaved and shined.

## BE CAREFUL OF APPEARANCE FROM THE REAR



If it has to be shown, dress up the back of your merchandise.

## DELIVER AND HANDLE CAREFULLY



It looked good when they bought it. Keep it that way in delivery.

## **DOTTED LINE ROSCOE ... by Bob Crosby**



**"Calling D. L. Roscoe. Calling D. L. Roscoe. This is Miss Jones. The boss wants to know where you put that last water heater contract."**

# THE BOTTLED GAS MANUAL

## Chapter 8

### Laying Out and Running The LP-Gas Pipe Line

WHEN you start for home to night it probably will be in a modern motor car, powered by a 125 hp. engine, and you will enjoy the exhilaration of speeding over a concrete highway through the night air at a speed of 60 miles per hour, or better. You will not realize it, but at 80 miles per hour 75% of the power of that engine will be used in overcoming air resistance.\* At 60 miles per hour the air resistance is four times what it would be at 30 miles per hour!

So accustomed are we to moving in this earth's atmosphere that scarcely ever do we give any thought to this matter of resistance of the atmosphere to motion, yet there are definite laws which govern the motion of gases, and the problem is such a large one that automotive manufacturers and aeroplane designers spend thousands of dollars on streamlining their products.

Our example of the automobile in motion is one in which the solid body moves and the gas is inert. We can reverse this condition by having the gas move within a pipe, and the laws which govern this matter of resistance to motion, or friction, are just the same.

**Laws of Fluid Friction.** For all fluids, whether liquids or gases, the following laws apply:

\* On authority of Buick Division, General Motors Co.

A. The resistance to motion is proportional to the pressure between the masses in contact.

B. The resistance is directly proportional to the area of the rubbing surface.

C. The resistance is proportional to the square of the relative velocity.

D. The resistance is independent of the material of which the solid is made, but dependent upon its degree of roughness.

E. The resistance is proportional to the density of the gas (or liquid) and in the case of liquids bears a relationship to their viscosities.

*Some Practical Applications.* In other words, the friction, and hence the pressure drop, would be twice as great in a 100-ft. pipe line as in a 50-ft. line for the reason that we have doubled the surface in the 100-ft. line with which the gas must come in contact during its trip through it. We can counteract this added friction by reducing the velocity of the gas through the medium of a larger pipe.

If we wished to reduce the pressure drop in the 100-ft. line so it

- The Bottled Gas Manual series by C. C. Turner, started in the July, 1941, issue of BUTANE-PROPANE News and will continue to be published monthly in chapter form until completed. This series constitutes a valuable text book and field manual that should be invaluable to everyone in the liquefied petroleum gas industry.—Editor.

would be the same as in the 50-ft. line it would be necessary to increase the cross sectional area in accordance with the "*Basic Formula for Determining Pipe Sizes*" (Dr. Pole's formula), as set out in the second paragraph following herewith.

*The Importance of Minimum Pressure Drops.* This industry has adopted 11 in. of water column as the standard pressure at which all propane appliances using atmospheric burners are supposed to operate. Any large variance in pressure will have a marked effect upon the efficiency of the appliance, particularly in cooking appliances where the position of the cooking vessel is supposed to be at the tip of the corona of the flame. Variance in pressure causes a variance in the position of this corona,—hence, in efficiency. A tolerance of 5% either side of this pressure is permissible; hence, we have a range of pressure from 11.55 in. to 10.45 in. of water column within which manufacturers may design their appliances to operate. It is important that we shall pipe our systems to operate within these limits; otherwise, we may get into trouble, particularly in the case of pilot lights and automatic lighters.

*Basic Formula for Determining Pipe Sizes.* This industry of ours has accepted as basic the formula of Dr. Pole for figuring the capacity of pipe lines within the reasonable limits which we encounter from day to day. This basic formula is as follows:

$$Q = 1350 \sqrt{\frac{d^5 h}{s L}} \text{ in which}$$

Q=quantity of gas in cubic feet per hour.

d=diameter of pipe in inches.

L=length of pipe in yards.

s=specific gravity of gas, air being taken as 1.

h=pressure drop in inches of water.

I call your particular attention to this matter of "h". If we did not care to what point near zero the pressure dropped we would take 11 in. for this value, but remember that 10.45 in. is our low dead-line, or 11.00 in. — 10.45 in. = .55 in. pressure drop, so, for our purpose "h" becomes "*pressure drop in inches of water*" rather than "pressure in inches of water."

Our known values for propane are as follows:

s=1.52 h=.55" and by substituting these values we have the following equations:

$$Q = 1350 \sqrt{\frac{(d^5)(.55)}{(1.52)(L)}}$$

$$\text{or } Q = 812 \sqrt{\frac{d^5}{L}}$$

$$L = \frac{(659344) (d^5)}{Q^2}$$

$$d^5 = \frac{Q^2 L}{659344}$$

$$659344$$

As determining d from d<sup>5</sup> is a tiresome process, the values shown in Table 1 will facilitate the use of these formulae.

*Proportioning the Pipe Line to the Job.* Copper or steel pipe costs money, and it is therefore to our

**TABLE 1. VALUES FOR  $d^5$  AND  $\sqrt{d^5}$  FOR PIPE AND TUBING SIZES UP TO 1 IN. DIAMETER.**

Type of Pipe or Tubing	Inside Diameter	$d^5$	$\sqrt{d^5}$
1/8 in. standard welded pipe.....	.269	.00139	.0372827
3/8 in. O.D.* copper tubing.....	.311	.0028	.0529150
1/4 in. standard welded pipe.....	.364	.0063	.0793725
1/2 in. O.D. copper tubing.....	.436	.0157	.125300
3/4 in. standard welded pipe.....	.493	.0290	.170294
1/2 in. Type K copper tubing.....	.527	.0406	.201494
5/8 in. O.D. copper tubing.....	.561	.0555	.235584
3/4 in. standard welded pipe.....	.622	.0934	.305614
1 in. O.D. copper tubing.....	.666	.1309	.36801
3/4 in. Type K copper tubing.....	.745	.2293	.47885
1 in. standard welded pipe.....	.824	.3799	.61636
1 in. Type K copper tubing.....	.995	.9751	.98747
1 in. standard welded pipe.....	1.049	1.268	1.1260

\* O.D. signifies "Outside Diameter"

advantage to use as small lines as possible, but many of us make the mistake of using too small pipe lines. At the other extreme are those who install pipe lines which are too large.

Let us assume that we are confronted with the problem of what size of pipe to use on a flow of 50 cu. ft. per hour through 100 ft. of pipe. Substituting values in our formula for  $d^5$  we find that  $d^5 = .12$  plus. In the above table we find that .12 is more than .0934 in the  $d^5$  column and less than .1309, so we would use 3/4 in. O.D. copper tubing to carry this load.

*Finding Out What a Certain Size of Pipe Line Will Carry.* Let us now suppose that we have a 3/4 in. O.D. tubing line 100 ft. long, and wish to know how much of a load it will carry. We now use the formula for "Q" and by substituting values find that it is good for 51 cu. ft. per hour.

*Use of the Quick Reference Chart.* We do not always have the

time out on the job to bother figuring these things out accurately, so for our convenience there is herewith presented a chart for quick reference (Table 2) which is sufficiently accurate to be dependable for all but the most exacting requirements in which special sizes of piping or tubing particularly made for the purpose would have to be used. Let us again take our problem of a flow of 50 cu. ft. per hour through 100 ft. of pipe. What size of pipe will we use? First we convert our 100 ft. to 33-1/3 yds., then we follow down the "Cu. Ft. of Gas Per Hour" column until we come to 50. We follow this line over until we come to either exactly 33-1/3 or the next higher number, which in this instance is 34.5. Following this column back to the head of the page we find that 3/4 in. O.D. tubing is the proper size to use.

Let us use the chart for our other problem. We have 100 ft. of 3/4 in. O.D. tubing and we want to know how much gas it will carry. (We convert our 100 ft. to 33-1/3 yds.,

**TABLE 2. NUMBER OF YARDS THAT A PIPE LINE WILL CARRY  
CERTAIN QUANTITIES OF PROPANE GAS PER HOUR  
WITH A DROP OF (0.55 in.) WATER COLUMN**

Cu.Ft. Per Hour	$\frac{1}{8}$ -in. Std. Welded Pipe	$\frac{3}{8}$ -in. Std. Welded Tubing	$\frac{1}{2}$ -in. Std. Welded Pipe	$\frac{5}{8}$ -in. Std. Welded Tubing	$\frac{3}{4}$ -in. Std. Welded Pipe	$\frac{7}{8}$ -in. Std. Welded Tubing	$1\frac{1}{8}$ -in. Std. Welded Tubing	$1\frac{1}{4}$ -in. Std. Welded Pipe	$1\frac{1}{2}$ -in. Std. Welded Tubing
1	923.08	1846.							
2	230.7	461.5	1038.4						
3	102.5	205.1	461.5	1150.1					
4	57.6	115.1	259.6	646.9	1195.0				
5	36.9	73.8	166.1	414.0	746.8	1070.7			
6	25.6	51.2	115.3	259.7	531.1	743.5	1007.3		
7	18.8	37.4	84.7	211.2	390.2	546.3	740.0	1256.7	
8	14.4	28.8	64.9	161.7	298.7	418.2	566.6	962.2	1348.5
9	11.2	22.6	51.2	127.7	211.3	330.4	447.7	760.2	1065.5
10	9.23	18.46	41.53	103.5	191.2	267.6	362.6	615.8	863.0
15	4.1	8.2	18.4	46.0	84.9	118.5	161.1	273.7	383.5
20	2.3	4.5	10.3	25.8	47.8	66.9	90.6	153.9	215.7
25		2.8	6.6	16.5	30.5	42.5	58.0	98.5	138.0
30			4.6	11.5	21.2	29.7	40.2	68.4	95.8
40			2.59	6.4	11.9	16.7	22.6	38.4	53.9
50				4.1	7.6	10.7	14.5	24.6	34.5
60				2.6	5.3	7.4	10.0	17.1	23.9
70					3.9	5.4	7.4	12.6	17.8
80					2.98	4.18	5.6	9.6	13.4
90						3.3	4.4	7.6	10.6
100						2.67	3.62	6.15	8.63
110							3.0	5.0	7.1
120								4.2	5.9
130								3.6	5.1
140								3.1	4.4
150									3.8
160									3.3
170									
180									
190									
200									
210									
220									

Caution:—This table is computed in yards, not feet.  
The above has been calculated by the following equation:

$$L = \frac{659344 (d^5)}{Q^2} \quad \text{in which:—}$$

L = The length of the pipe line in yards.

d = The diameter of the pipe lines in inches (internal).

Q = The quantity of flow in cubic feet per hour.

then follow down the  $\frac{3}{4}$  O.D. tubing column until we come to exactly 33-1/3 or the next higher number. We find this to be 34.5, and by following out this line to the left we find the capacity of the line to be



TABLE 2—Continued

Cu. Ft. Gas Per Hour	3/4-in. Type K Tubing	3/4-in. Std. Welded Pipe	1-in. Type K Tubing	1-in. Std. Welded Pipe
10	1511.8			
15	671.9	1113.		
20	377.9	626.2		
25	241.9	400.7	1028.6	1337.6
30	167.9	278.3	714.3	928.9
40	94.4	156.5	401.8	522.5
50	60.4	100.1	257.1	334.4
60	41.9	69.5	178.5	232.2
70	30.8	51.1	131.2	170.6
80	23.6	39.1	100.1	130.6
90	18.6	30.9	79.3	103.2
100	15.1	25.0	64.3	83.6
110	12.4	20.7	53.1	69.0
120	10.4	17.4	44.6	58.0
130	8.9	14.8	38.0	49.4
140	7.7	12.8	32.8	42.6
150	6.7	11.1	28.5	37.1
160	5.9	9.8	25.1	32.6
170	5.2	8.6	22.2	28.9
180	4.6	7.7	19.8	25.8
190	4.1	6.9	17.8	23.1
200	3.7	6.2	16.7	20.9
210	3.4	5.6	14.5	18.9
220	3.1	5.1	13.2	17.2
230		4.7	12.1	15.8
240		4.3	11.1	14.5
250		4.0	10.2	13.3
260		3.7	9.5	12.3
270		3.4	8.7	11.4
280		3.1	8.2	10.6
290			7.6	9.9
300			7.1	9.2

50 cubic feet of the gas per hour.

*Laying Out the Job.* Before we can determine what sizes of pipe

are to be used we must of course first determine where the appliances are to be located and where the pipe lines are to be run. If possible, the heaviest loads should take off from the main line nearest to the regulating equipment, and the appliances should follow progressively in relation to the amount of gas that they draw. While this is not absolutely necessary it is desirable from the standpoint of evenness of operation and reduced installation cost.

### Difficulties Are Presented

In the laying out of a job we are confronted by two conflicting purposes. A piece of pipe is not exactly a work of art, and the house-owner wishes to have it concealed. On the other hand it is bad business to conceal copper tubing within a partition. Someone may at sometime wish to make alterations and in so doing drive a nail into the tubing or saw into it, thereby causing a leak. It also is a poor policy to have joints within a partition. If the appliances are all located upon the first floor and there is a basement beneath the house, our problem is a simple one, for we would run the trunk line on the ceiling of the basement and go directly up to each appliance with a riser. Sometimes it is possible to conceal our line beneath the edge of a clapboard on the exterior of the building and go directly through the wall to each appliance.

The running of risers to the upper floors of a building presents more of a problem. Often this may be accomplished by running our trunk line up along the side of an



# Specialty

More and more L. P. Gas dealers are turning to GRAND . . . the modern range specially engineered to perform efficiently with L. P. Gas. There's a complete line of models to satisfy the cooking needs of any family . . . priced to attract retail customers and to give you a generous profit.



**Grand Champion RB-10**



**SAFE-TEE-KEE EQUIPPED**

Exclusive on Grand Ranges, the Safe-Tee-Kee locks the gas supply when range is not in use. No worry about children playing with lighting burners or brushing against them accidentally. Gas can't escape. It's safety assurance for the home and an economical safeguard.

**LEAKAGE PREVENTED.** Every joint and valve is specially sealed, and tested for the particular type of L. P. Gas to be used.

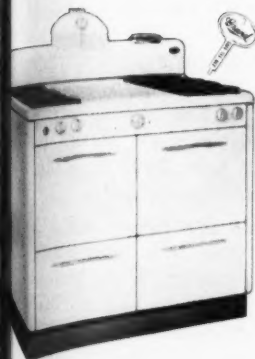
The GRAND CHAMPION of ranges, from its flush-to-floor base to its smart non-glare lac and built-in Timer. Flexitop with interchangeable griddle and four simmer burners, roomy Champion oven and Charcol-ator Broiler offer superior cooking service. **ECONO-SPEED BURNERS** give quick positive lighting, reduce gas waste. It's a champion in operation and fuel economy.

**There's A Grand Range For Every Purse, Every Purpose**

# Designed For

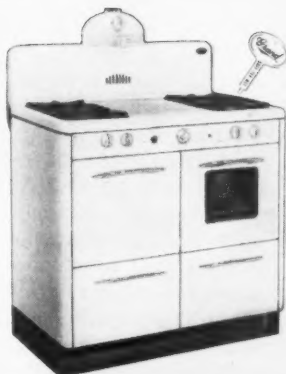
Superior Performance with

# L.P. GAS



## Model RB-84X

Divided cooking top, full 40" wide. One Giant burner, two rear simmer burners. Oven 19" deep, 18" wide. Electric oven light. Large compartment and storage drawer, Ebonite finished. Pull-out drop-door broiler, safety-lock oven shelves.



## Model RB-65X

Divided top, 37" wide. "Peek-a-boo" oven, 19" x 16", "Sunshine" oven light. Two storage drawers, pull-out broiler. Simmer valves on both rear burners. Acid-resistant porcelain top, speckled enamel finish broiler and oven.



## Model RB-3X

Conventional top, 37" wide. Quick-positive top burner lighter, two rear simmer burners. Oven 19" x 16", two large storage drawers. Pull-out broiler with one-piece broiler pan.



## Model RB-6X

Divided 37" top with 2 rear simmer burners. Oven 19" x 16", two safety-lock oven racks. Two-piece broiler pan, two large storage drawers. Non-glare lamp with built-in timer.



## SAFETY OVEN PILOT

Can't be extinguished by drafts or by opening and closing of drawer or oven door. 100% cast iron. Placed to give years of efficient service.

All models on this page are equipped with SAFE-TEE-KEE and Robertshaw Oven Heat Control.

# GRAND RANGES • CLEVELAND, OHIO

Division of The Cleveland Cooperative Stove Co.

edge board on the exterior of the building, and then in through the wall to the appliances. Copper tubing can be hidden behind steam, water or waste pipes, and oftentimes there is a space around the chimney where we may fish through our pipe lines.

### **Regulator for Each Floor**

If you are confronted with the problem of handling appliances on several floors through one system, don't attempt to handle the job through one regulator. Use a household regulator at each floor, and have the main regulator set at approximately 1 lb. pressure. Otherwise, because of the weight of propane it will be impossible for you to maintain an 11 in. water column pressure on each floor. Either you will have too high pressures on some floors or too low pressures on others.

There are many special fittings on the market which will contribute much to the neatness of your job, and at the same time save expense. By way of example, there is a special fitting from  $\frac{3}{4}$  in. to flare sizes and it is an excellent substitute for the usual conglomeration to be found there. Pipe clips are available for both pipe and tubing, and so are floor and ceiling plates.

If you use copper tubing get the proper tools for it, and learn how to use them. Don't try to make sharp bends with your hands, but buy a good bending tool. For straightening out kinks or bulges in the line a piece of square root angle iron and a crutch rubber on the end of a common nail hammer will do the trick. If you can't buy

the square root iron locally, cut it out of the frame of an old iron bedstead. Place the tubing between the two legs of the angle iron and follow along the kink by tapping lightly with the hammer on which you have placed the crutch rubber. Don't try to feed copper tubing directly from the roll, but first roll out the quantity that you think you will use on the floor or upon a board. Avoid stiff tubing. It will bother with cracking when you try to flare it. Don't buy cheap fittings. They may stand the strain of proper tightening for the time being, but have been known to crack at a later time with disastrous results.

*What Should Be Used on Pipe Joints?* No "dope", or compound, should be used on a POL connection, flare, ground, or sleeve joint. Don't be afraid to use a little elbow grease and tighten them up properly. If they are the right kind of fittings they will stand about all that you have to give them.

### **Select Compounds Carefully**

For threaded joints there are several excellent compounds on the market, but before using them be sure that they are suitable for propane. Compounds which will hold manufactured gases are not suitable for propane. Pure orange shellac is excellent for low pressure joints, but care must be taken to apply it only to the male threads, as it will flake off inside the pipe and cause trouble at the appliance orifices. A very satisfactory "dope" can be made by thickening orange shellac with dry powdered lamp-black until the mixture is about the consistency of thick cream. The

lampblack must be well mixed with the shellac before using it, and it is recommended that after thorough mixing it should be allowed to stand in the can or bottle for 24 hours before using. Litharge and glycerin makes an excellent compound for high pressure use. The pipe joints must be thoroughly cleaned before it is applied, and no more than can be used in a half-hour's time should be mixed at one time. This should also be mixed to the consistency of thick cream.

It only requires a drop or two of any compounds upon the male threads of the joint to accomplish a tight connection. Remember, that which you plaster on the inside of the fitting or onto the outside of the pipe does not do one particle of good.

Be neat and exacting in your work. Start with your own appearance. Don't scatter your tools all over the place. Put down newspapers on the floor where you are working. Don't use the kitchen table or range top for a work bench. When you get ready to leave be sure to clean up the mess that you have made, and apologize to the lady of the house for the inconvenience that you have caused her.

Remember, at the time of your contact with the customer you are the most important link in the train of relationships between the customer and your company. You are not just another mechanic, for your job requires both knowledge of engineering and the ability to execute that knowledge.

Live up to the responsibilities of your position!

Now let's consider some ques-

tions on this chapter. Answer them to the best of your ability and then turn to Page 92 to see if you are correct.

### Questions on Chapter 8

1. What is the relation of resistance or friction to the internal area of a pipe line?
2. What is the relation of resistance or friction to the relative velocity of gases flowing through a pipe line?
3. What is the relation of resistance or friction to the specific gravity of a gas?
4. How much gas would a 4-in. diameter pipe line carry in relation to a 2-in. pipe line at the same pressure?
5. What amount of variation in pressure is allowable on a propane installation?
6. As applied to pressure drop in pipe lines in the propane industry, what does "h" stand for in Dr. Pole's formula?
7. What allowance in pipe line length should be made for each ell or right angle?
8. A pipe line is to be 1350 ft. long; the load is 22 cu. ft. per hour. Using the formula for  $d^5$  what should its diameter be?
9. If appliances are located on several floor levels and connected to the same system what should be done to maintain proper pressures at each appliance?
10. On what type of pipe connections should pipe "dope" never be used?

(Chapter 9 of THE BOTTLED GAS MANUAL will appear in the March issue, of BUTANE-PROPANE News).

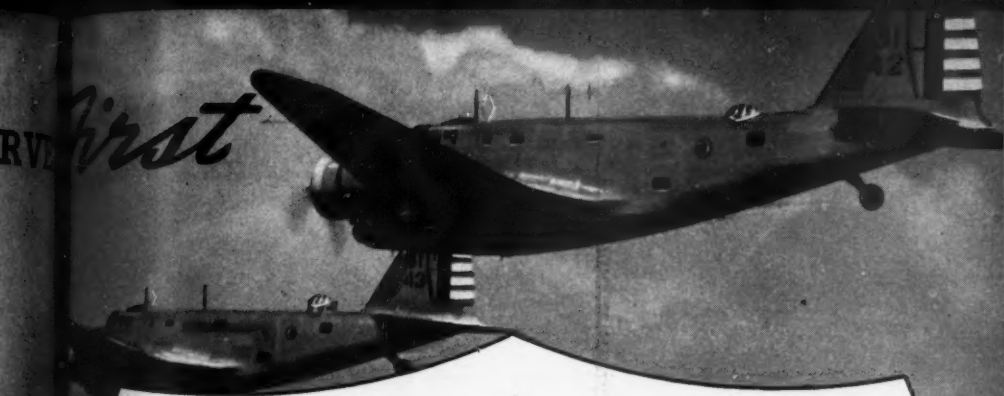
NATIONAL DEFENSE MUST BE SERVED



DOING THEIR  
SHARE FOR  
NATIONAL DEFENSE

**REGO**  
CYLINDER VALVES





WE WOULD LIKE TO MARK YOUR ORDER . . .

## *For Immediate Delivery*

Americans understand that National Defense production must be the first consideration of industry today. Bastian-Blessing is doing its part in this important production assignment by supplying cylinder valves, regulators and other Rego products.

Defense, plus the serious problem of obtaining materials and supplies, have thrown an extra burden on us. Our new modern plant and improved facilities are helping to keep up with the increased production demands for defense and non-defense work.

We are very proud of the fact that we are doing an outstanding job in supplying the LP Gas industries' needs. However, every operator must recognize the wisdom and needs for materially restricting expansion in non-defense activity and act accordingly.



Assure perfect performance and economy by insisting on genuine Bastian-Blessing products identified by the Rego trademark.

*The* **BASTIAN-BLESSING Co.**

4233 Peterson Avenue

Chicago, Ill.

Pioneers in equipment for using and controlling high pressure gases.



# *Your Business After the War*

## *Hinges Upon Your Plans Now*

By FRANK P. DE LARZELERE

President, Southern Gas & Equipment Co., Little Rock, Ark.

**T**HE business organization which now is feeling the crimp of priorities, and is being compelled to operate on a drastically curtailed production and sales basis, faces a complex batch of problems.

Let's say that such a firm has, through aggressive advertising and a hard-hitting sales program, built a constantly expanding business record. What road should it travel from now on, with very little merchandise to deliver to its customers; should the company discontinue its advertising program and merely fill what few orders it can—or should the firm continue to keep its name and products-identity firmly fixed in the minds of prospective customers?

The answer to the question need not be theoretical. Instead, it can be based on facts—facts developed following the first world war. A survey made at that time showed that of 10 well known firms which discontinued advertising during the war period, four were out of business shortly after the close of the war, one went into bankruptcy, and three had been passed in sales and prestige by competitive companies which previously were insignificantly small by



F. P. DE LARZERE

comparison, but gained momentum through aggressive advertising while their larger competitors were asleep.

Certainly the fact that eight out of 10 firms either were put out of business or suffered severe reverses when they stopped advertising during the war period should prove a guide to all business men during this present war. Without constant reminder, your customers soon forget you. Stop advertising, and your competitor who doesn't may end up with entirely too many of your customers.

One of the hardest-hit of all companies right now is the Aluminum Goods Manufacturing Company, makers of nationally-famous Mirro Aluminum products. Read what R. L. Pritchard of this company says of their advertising: "Today, and until the nation's defense needs have been satisfied, the manufacture of aluminum utensils has been drastically curtailed. In the meantime, we plan to keep the Mirro name before the public through timely advertising in leading women's publications, to maintain friendly contact with our customers.

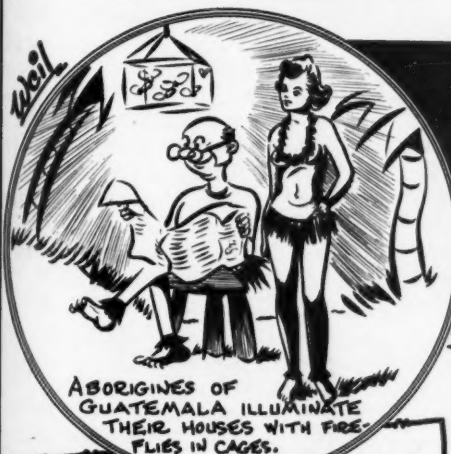
In England, where countless companies have long ago been forced completely out of production of civilian merchandise, it is the rule rather than the exception for these companies to maintain their regular advertising campaigns. The old maxim of "Out-of-sight, out-of-mind" certainly should be considered carefully by any business man who is thinking of discontinuing advertising "for the duration."

# DIDJA KNOW BY WEL



## SUPER SNIFFER

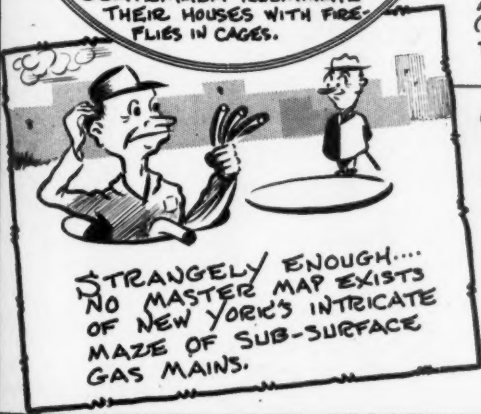
IN 1873 THE PARISIAN CITY COUNCIL VOTED TO CREATE THE POSITION OF "OFFICIAL ESCAPING GAS DETECTOR" WHICH PAID 90 CENTIMES PER DAY.....THE JOB REQUIRED THE GAS SLEUTH TO REPORT ALL LEAKS EVERY TWO DAYS.



ABORIGINES OF GUATEMALA ILLUMINATE THEIR HOUSES WITH FIRE-FLIES IN CAGES.



THE DEEPEST HOLE IN THE WORLD----IS A SAN JOAQUIN VALLEY (CALIF) OIL WELL-15,004 FEET DEEP....NEARLY 3 MILES!



STRANGELY ENOUGH.... NO MASTER MAP EXISTS OF NEW YORK'S INTRICATE MAZE OF SUB-SURFACE GAS MAINS.

**\$1.00** WILL BE PAID FOR UNUSUAL FACTS ABOUT GAS AND GAS APPLIANCES. SPECIAL CONSIDERATION WILL BE GIVEN TO UNUSUAL LPG SALES PLANS.

ADDRESS YOUR LETTERS TO THE EDITOR OF THIS MAGAZINE.

# *Butane Provides Home Comforts to 26,000 Officers and Men*

Liquefied Petroleum Gas is now playing an important role in the maintenance of one of the country's largest army cantonments. Camp Roberts, located four miles north of San Miguel, Calif., on Highway 101, has three modern plants serving it with gas for cooking, hot water and space heating.

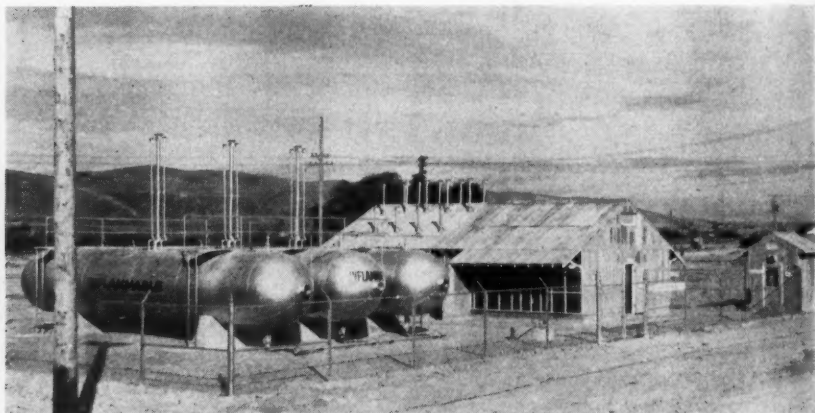
One of the largest users of LP-Gas, the camp accommodates 26,000 officers and men at one time. The average length of their stay is 15 weeks, during which time they are put through an intensive training course.

Two butane-air plants are located at West Garrison. These were designed by Ransome Co. Each has

By J. L. RHODES

a capacity of 80,000 cu. ft. per hour. The third plant, located at East Garrison, was installed by Gas-Air Corp. and has a capacity of 50,000 cu. ft. per hour.

The butane-air produced has a B.t.u. content of 1620. All appliances are equipped with regular natural gas orifices which have proved very satisfactory because of the heavy specific gravity of the fuel. The butane storage consists of eight 12,300-gal. tanks. These have proved ample for all requirements. Daily deliveries insure a steady supply of fuel.



View of plant No. 1, located at West Garrison. This plant has a capacity of 80,000 cu. ft. per hour and is one of two such plants providing butane-air for cooking, heating and water heating at West Garrison.



# Call on us at any time

Why wrestle with the problems that keep coming up all the time concerning Liquefied Petroleum Gas? More than likely Shell Engineers can save you the trouble—for over a period of many years they have accumulated a wealth of valuable and diversified experience.

Their experience—covering domestic, commercial and the industrial fields—is your assurance of competent advice on such subjects

as equipment design, application methods, storage and handling methods, construction of facilities.

The length of this experience is your assurance of the soundness of the service offered you by Shell Engineers. Why not call in Shell on your next LP Gas problem?

• • •



For further information write:  
**SHELL OIL COMPANY, INC.,**  
50 W. 50th St., N. Y., N. Y., or 100  
Bush St., San Francisco, Cal.

## SHELL LIQUEFIED PETROLEUM GAS

There are 1208 buildings on the post that are served with gas. These include 144 mess halls, four theaters, a service club and sports arena. There are 35 miles of mains and laterals. The comforts and conveniences made possible by the butane installations are greatly appreciated by the men.

Facilities have also been provided for the transportation of butane to distant points for range detachments. A special tank, mounted on wheels, has been built to haul the fuel wherever it might be needed.

This widespread use of LP-Gas in army camps would indicate that butane and propane are doing their

part in national defense. It is also important to remember that thousands of men are becoming acquainted with LP-Gas and this will be an important factor in the growth of the industry after the war.



### **Fire Marshal Garner, Oklahoma, Seeks Industry Cooperation**

A circular letter sent by Carl C. Garner, Oklahoma state fire marshal, to dealers and distributors of LP-Gas fuels, appliances and equipment, seeks their cooperation in checking some reported violations of the recently adopted LP-Gas regulations.

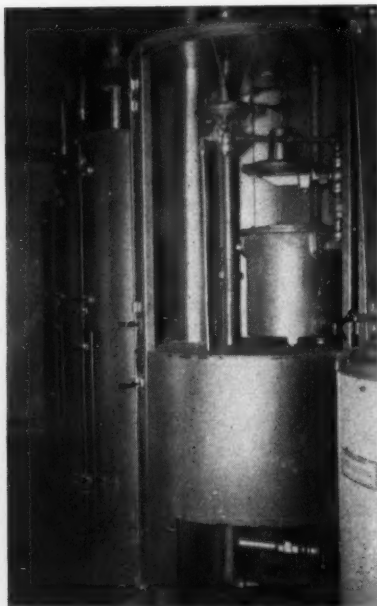
All installations must be made by state licensed and bonded men, says the letter. Warnings that failure to comply with the regulations and the state law upon which they are based, subject violators to heavy fine and imprisonment, are given.

Some violations that have been reported to Mr. Garner, who by virtue of his office also is State liquefied petroleum gas administrator, are: Failure to carry fire extinguishers; no drag chains; permitting exhaust from truck under fuel tanks; tanks painted wrong color; improper relief valves; lack of vapor return line, and failure of operators to use them when they are so equipped; operators smoking while driving, and when loading and unloading trucks; hose connections in bad order, drivers parking in fire zones, and failure to report to fire chiefs, as recommended in State rules and regulations.



### **Bruggeman & Buerkle To Serve Skelgas in Fairfax, Minn.**

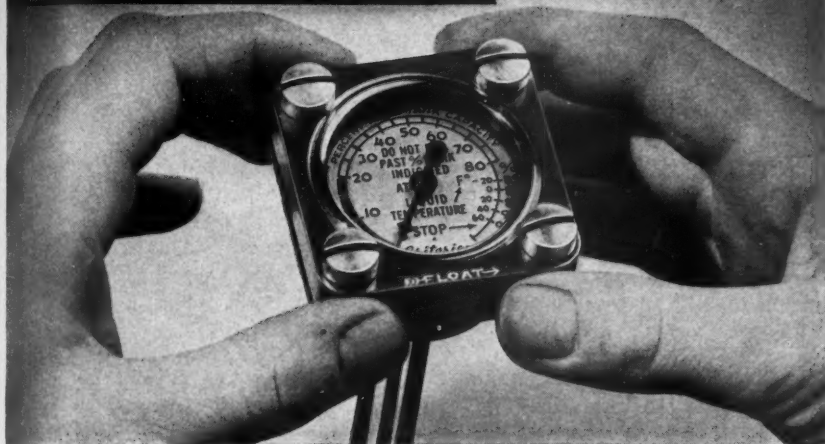
Bruggeman & Buerkle have been appointed Skelgas dealers in the community of Fairfax, Minn., according to a recent announcement.



Bank of four vaporizers. Sixteen of these are in use at each plant at West Garrison, Camp Roberts.



*It's a FACT!*



## More Rochester Criterion Gauges Were Placed In Service During 1941 Than Any Previous Year!

■ 1941 proved to be a banner year for the L. P. Gas Industry and we are proud of the part that Criterion Gauges have played in the phenomenal growth of this comparatively new industry which is serving an ever increasing market. Today, Rochester Criteria incorporate new features which contribute to even greater accuracy and operating efficiency. In keeping with our service policy, we will continue to make prompt deliveries on all orders supported by Priorities.

### NEW FEATURES FOR 1942

**ROCHESTER MFG. CO., Inc.**

19 Rockwood Street  
Rochester, New York

1. HERMETICALLY SEALED Dial Chamber keeps out all dust and water.
2. NEW FLOATS with larger displacement can be installed through 1½" extra-heavy pipe.
3. SMALLER, more compact counterbalancing mechanism.
4. OPTIONAL HEADS available for various types of counter units or pipe thread fittings.

# ROCHESTER *Criterion* GAUGES

# Merchandising Appliances In An Arizona Market

By W. T. JOPLIN

Vice President, Butane Corporation, Phoenix, Arizona\*

**A**LTHOUGH we officially opened our appliance store at 11 East Van Buren St., Phoenix, Ariz., less than a year ago, we have been in business selling butane more than five years. Until last year our business has been principally fuel and butane installations and servicing of gas installations. We allowed the dealers to sell the appliances and cooperated with them, providing fuel for customers to whom appliances were sold. When the dealers made a sale of appliances, we were notified and then made the gas installation, connected the appliances and served the customer from that time on.

Our gas service includes practically all types of uses beyond the gas mains, such as tourist courts, guest ranches, residences, hotels, schools, churches, and all types of tractor, pumping, ginning and agricultural uses.

We feel that our success in the

\* This article was written in 1941 before war curtailment effects were felt.—Ed.



W. T. JOPLIN

sale of butane appliances has been brought about by the fact that we have consistently advertised, "Specially Designed Appliances for Butane." We have often been asked why we did not advertise "Gas Appliances," thus taking advantage of the natural gas market within the area served by natural gas mains. Our answer to this is that in so doing, we are just another appliance store, selling gas appliances, whereas in specializing in butane appliances, we are working in a less competitive field.

We were agreeably surprised at the amount of business to be had through the sale of butane appliances. Our first consideration in opening our store was location; and second, attractiveness and appeal. Our particular location was chosen not only because of the heavy foot traffic passing the store, but also because of the nearby available space for parking. An attractive Neon sign on the outside of the building, as well as a modern store front, permitted our location to become firmly imbedded in the minds of people passing the store. Our store is not particularly large. We feel that a room 25 x 60 ft., with an attractive entrance and the merchandise well displayed, is often less confusing to a customer

# 70 YEARS' EXPERIENCE

*an asset that spells security!*



*Let* **FLORENCE**  
*do your Cooking*

Florence has been in business since 1872. We have learned a lot in that time—you have to, to stay in business for 70 years!

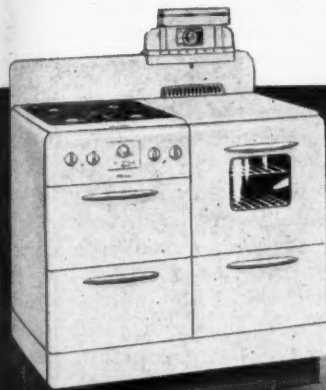
We've learned what millions of American women want most in their cooking . . . how to build consistently better ranges year after year. We've learned how to give your customers increasingly better, easier cooking . . . how to give *you* more and more to offer in Florence Ranges for L-P gas.

Through the years, the name "Florence" has become a symbol for the best there is in cooking! Florence national advertising will *continue* to keep that name a household word. And Florence technicians are working *now* to give you even better Florence Ranges to sell tomorrow—to create new and better opportunities for you as a Florence dealer.

Remember that 70 years of experience put a firm foundation under your future.

★ ★ ★

*Florence Serves for Victory*—At both Gardner and Kankakee, Florence workers are busy filling important War Department contracts. This is in addition to supplying Florence Ranges and Heaters for Defense Housing projects.



**FLORENCE  
GAS RANGES**  
**For L-P Gas**

**BACKED BY 70 YEARS' EXPERIENCE**

**FLORENCE STOVE CO., General Offices and Plant, Gardner, Mass.; Western Offices and Plant, Kankakee, Ill.; Sales Offices: 1459 Merchandise Mart, Chicago; 45 E. 17th Street, New York; 53 Alabama Street, S.W., Atlanta; 301 N. Market Street, Dallas; and 2730—16th Street, San Francisco.**

**FEBRUARY-1942**

than a large room where too many different types of merchandise may be seen.

We handle two makes of ranges exclusively, and try to keep on our floor in a well arranged display only one of each model, the remaining stock being kept in the warehouse.

The prospective customer is greeted at the door by a courteous salesman who is thoroughly conversant with our appliances, as well as with the use of butane. He knows the points about a range that appeal to the housewife. He first shows her its beauty, then the insulation, the convenience and the ease with which it can be kept clean. Many a housewife dislikes to use a broiler because of the drudgery in cleaning afterwards. Naturally the more convenient and simple the cleaning after a meal, the more cooking and baking a housewife will do. This added cooking, baking and broiling builds up our gas load and this is our ultimate goal.

#### **Sells Water Heater Idea**

Our customer is then shown the water heater, and the explanation is made that at a small added cost per month she may have continuous hot water at all times of the day or night, and that she does not have to be inconvenienced by waiting for the water to heat, or risk the danger of singed eyebrows by getting down on her knees to light the heater every time hot water is desired.

The greatest convenience in the home today is the automatic hot water heater, and now that there

are burners with safety shut-off valves, thus reducing to a minimum the chance of hazard, we seldom sell anything except automatic water heaters. They also have American Gas Association Testing Laboratory approval for butane stamped on each and every heater, which is not only taking well with the customer, but has been the means by which FHA has approved them for loans, thus making it possible to install them in many new homes beyond the gas mains, with the contractor paying cash to us from FHA loans, with no recourse.

#### **Appearance Plus Service**

We also feature a cabinet space heater which not only has a perfect combustion chamber, providing the correct flame at all times, but also gives our customers a nice piece of furniture, which adds to the appearance of a room.

Our advertising consists of a 15-minute radio program once a week. The past year it has operated along the lines of the "Pot of Gold" program, in which every private telephone number in the Salt River Valley was taken off and made into a private telephone directory. The wheel of chance was spun twice, once to get the page number, the other to select the number to be called. Our slogan is, "Butane Begins Where the Gas Main Ends." When the number selected and called answered by saying, "Butane Begins Where the Gas Main Ends," they were awarded a \$15 cash prize; if they said only, "Hello," a \$5 prize was given. If no answer, a \$1 prize, the other

# Defense Savings Pay-Roll Allotment Plan

*No company heads can  
help their country, their  
employees, and themselves*

## voluntary pay-roll allotment plan

helps workers provide for the future;  
helps store up tomorrow's buying power;  
helps defend America today.

Business heads are adopting the Voluntary Pay-Roll Allotment Plan as a simple way for every worker to start a systematic and continuous Defense Bond savings program. It is a sensible step toward reducing the ranks of the post-war needy. It will help spread the financial participation in national defense among all of America's wage-earners. It will materially retard inflation by "storing" part of our pyramiding national income, thus reducing the demand for our diminishing supply of consumer goods.

*In emergencies, America doesn't do things "hit-or-miss."* We would get there eventually if we just left it to everybody's whim to buy Defense Bonds when they thought of it. But we're a nation of businessmen who understand that the way to get a thing done is to *systematize* the operation. That is why so many employers are getting back of this voluntary savings plan.

DSD—BP 1A

All you have to do is offer your employees the convenience of having a fixed sum allotted from each pay envelope to the purchase of Defense Bonds. Each employee who chooses to start this savings plan decides the denomination of the bonds to be purchased, and the amount to be allocated from his wages each pay day. You deliver a bond to the employee each time his allotments accumulate to a sufficient amount.

*Plenty of help available.* The Treasury Department is ready and willing to give you all kinds of help. Local civilian committees in 48 States are set up to work with you just as much as you want them to, and no more. We will supply most of the necessary material.



*The first step is to take a closer look.* Writing for details in no way obligates you to install the plan. It simply indicates that you'd like to do *something* to help keep your people off relief when defense production sloughs off; *something* to enable all wage-earners to participate in financing national defense; *something* to retard inflation and store up tomorrow's buying power. So, write for the free kit of material being used by companies that have installed the Voluntary Defense Savings Pay-Roll Allotment Plan. Address: Treasury Department, Section A, 709 Twelfth Street NW., Washington, D. C.

\$4 being held over to the next week, making our prize \$1, \$9 and \$19. Occasionally, these amounts piled up to \$25 to the person who answered with our slogan. It was not uncommon for miscellaneous telephone calls to be answered with our slogan during the entire program.

This year we are using a slightly different type program. It is called the "Butane Hats Off Program" in which we select various residents of the community for some good deed they have done or some outstanding success that has come to them during the past week. We

have been highly complimented on this particular program, even though there is no cash prize awarded. In addition to this advertising, we carry display advertising in local newspapers and often in high school and junior college papers.

In connection with our advertising in the high school and junior college publications, we find that not only do these children take home the idea of modernizing, or butanizing the home, but the high school girl of today is the housewife of tomorrow. We know positively that many country schools



The store front of Butane Corp., Phoenix, Ariz., is keyed to modern pattern followed in large cities—strong light contrasts, limited but effective displays.





**G**

**ENTLEMEN, we need a**

## **Butane Standby Plant**

"In these days, when anything may happen, the necessity of a Butane Stand-by Plant becomes more apparent. We must keep the wheels turning in our plant at all costs. We would be remiss in our duty if we sidestepped the protection of our gas supply any longer. I suggest that we call in the Ransome engineers today." Those are the conclusions being reached in many industrial plants today, and Ransome is answering the call.

# **RANSOME COMPANY**

*Designing and Constructing Engineers*

**4030 HOLLIS STREET • EMERYVILLE, CALIFORNIA**

*Ransome*

**FEBRUARY-1942**

have put in butane for their cafeterias and that the domestic science rooms have graduated girls who have, a short time later, become housewives and bought butane.

#### Telephone Calls Follow Advertising

A great many of our inquiries come in by telephone as the result of this advertising. Five full-time salesmen are employed in our store in addition to the sales manager, John Gabriel.

We do not attempt to sell the gas plant systems, but merely lease them at a fraction of the cost that would be involved in purchasing the plants outright. This enables us to forecast our gas load, based on the number of installations, and to arrange for sufficient delivery and servicing equipment.

We are thoroughly convinced

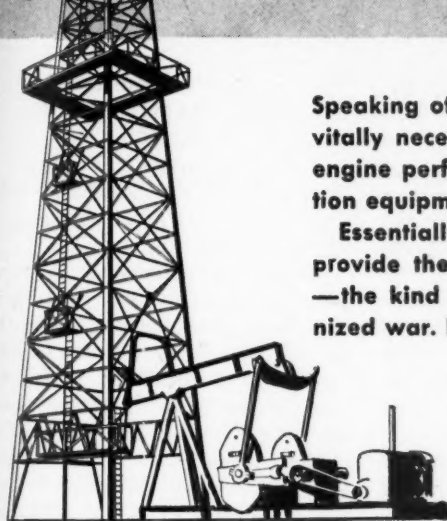
that no distributor of butane can secure satisfactory coverage without supplementing his operations with the sale of appliances. Our rate of installations has increased many times over since the opening of our appliance store, and we have naturally had to increase our servicing and delivery equipment materially, as well as our personnel. We also find that in selling our own appliances, we are able to obtain more satisfactory results, as in many cases dealers without the knowledge of what is required to properly burn butane may sell a makeshift range or water heater; and as we are expected to keep these appliance in adjutment, our service cost has been heavier.

Our gas installations are entirely of the aboveground type which simplifies the leasing plan.



The truck of Northwest Butane Gas, Inc., in the foreground of the picture above is often seen in the vicinity of Pocatello, Idaho, servicing many homes in which meals are cooked, food is preserved and water is heated by butane and propane gases. The bulk plant and office of the company are also shown. L. J. Thatcher, owner, is equipped to furnish underground, aboveground or bottled gas systems.

# *Good Carburetion* —AN ESSENTIAL

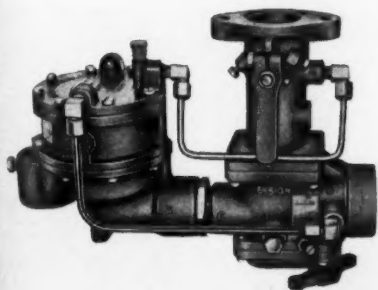


Speaking of essentials—good carburetion is vitally necessary for continuous dependable engine performance. Building good carburetion equipment is our business.

Essentially, internal combustion engines provide the most valuable source of power—the kind of power that will win a mechanized war. Drilling wells, pumping the crude, refining and transporting the finished product—high test gasoline utilized in a thousand defense needs.

Maximum engine performance depends upon the accurate control and proportioning of gas-air mixtures. This is the principal function of ENSIGN Fuel Regulators and Gas Carburetors.

Constant research and testing results in the development and application of new and improved principals—those features you enjoy in today's carburetion.



# **ENSIGN**

## **CARBURETOR CO., LTD.**

HUNTINGTON PARK, CALIF. • DALLAS, TEXAS • CHICAGO, ILL.

# BUTANE *Power*

## Propane Powers Midwest Fleet

**T**HE use of LP-Gas in the Middle-west and Northern states for engine power has been on the increase during the past two years and is now attracting considerable attention in certain sections where the installations have been especially successful.

A number of large fleets have been "changed over" to operate on this fuel during this period with great success. One of the outstanding examples is that of the Red Owl Stores, Inc., fleet, with headquarters in Minneapolis.

A Skellyfuel account, the Red Owl fleet installation was made by

Kenny Edmonds and Clovis Fry, of the Skelly Oil Co., and J. D. Arden and Carl Hammond, representatives of the American Liquid Gas Corp., of Los Angeles. Algas "multi-jet" carburetion equipment was used on all units.

Seventeen trucks have been equipped to run on butane. All units of the fleet are Internationals, K-6's and K-7's. They are of the semi-trailer type and may be in operation constantly, and the tractors may be changed from empty to loaded trailers in a few minutes time.

Due to the extreme cold during



Eight of the 17 Internationals equipped to operate on LP-Gas for the Red Owl stores in Minnesota. The fuel, a mixture of butane and propane, is stored in 50-gal. tanks.



One of the Red Owl Internationals being fueled from temporary storage in skid tank. Operator is here using hand pump. A permanent storage is being installed, with modern pumping and metering facilities.

the winter months, the trucks run constantly while operating out of doors. Each truck has been equipped with two 50-gal. tanks and operates on Skellyfuel, a mixture of butane and propane.

The trucks travel several thousand miles each month, delivering food products from warehouses in Minneapolis to stores scattered over a territory several hundred square miles. It is reported that the trucks average more than seven and one-half miles to the gallon on butane. The saving on oil is great and motor wear has been but a fraction of what it was on gasoline.

A fuel supply has been provided by the Skelly Oil Co. near the warehouse. Although a large skid tank has been used for storage purposes, a permanent storage tank is being installed in order that fuel may be purchased in large quantities. The fuel is changed uniformly during the different seasons of the year in order to give

proper service at changing temperatures. Colder months, of course, demand a mixture richer in propane.



### C. B. Dodd Opens Service Station in Desert Resort

Desert Hot Springs' (Calif.) first gasoline service station was built in December. It is a two-pump station and was erected by C. B. Dodd on the corner of the Idle Hour Cafe lot on Palm Drive. Butane will be served to trucks and tractors.

In addition to the new service station and long-established cafe, Mr. Dodd also operates the local branch of the lumber yard and the branch office of the Liquefied Gas Co.



### Ransome Co., Emeryville, Calif. Installs San Luis Obispo Plant

A new super-service station which will serve butane fuel to automotive vehicles has been installed at San Luis Obispo, Calif., by the Ransome Co., of Emeryville, Calif.

# Defense Plant Utilizes Butane To Speed Up Drying Process

**T**HE Iron and Steel Products Co., Inc., New Orleans, manufacturers of fabricated steel buildings, recently completed an army encampment in South Carolina, composed entirely of galvanized steel and angle iron construction.

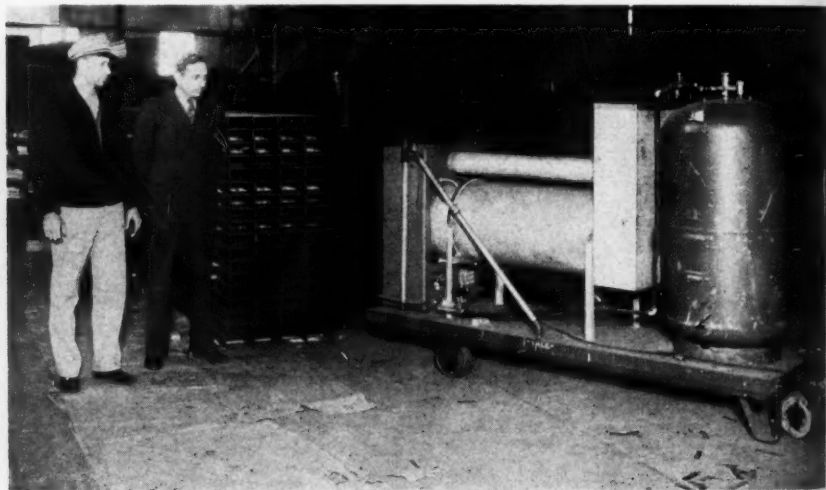
Engaged in national defense work the tremendous increase in the volume of their business has made it imperative that they dip the steel in red lead and that the drying of the steel be completed within the shortest possible time. Since weather conditions affect this

By FRED E. KUNKEL

very greatly, they decided to become independent of the weather.

So they rigged up a special butane gas-fired heater which helps the paint to dry and the novel application is shown in the picture.

"Due to the low temperature of the air in the plant, a box was built to control the air flow," according to Enau L. Chenevert, production manager. "This catches the air from the exhaust or vent



The improvised butane heater unit used for speeding up the drying of freshly painted steel on rush defense orders in the plant of the Iron and Steel Products Co., Inc., New Orleans. At left is John Linn, designer of the dryer, and Enau L. Chenevert, production manager, inspecting the finished job.



and brings it back into a chamber a few feet away, and then brings it back through the heater. We cut the capacity of the fan through the flow of air, because it was taking too much air in the enclosed box.

"So in front of the box is an adjustable damper to cut the capacity. There is a 1½-in. space between the pipe and the fan, which lets some air in there. Up front in the box are two little dampers which are adjustable for whatever quantity of air is desired.

"The device is mounted on rollers and can be pushed anywhere and set down for use. All you do is just plug in an extension cord."

Technically, this means that the products of combustion are recirculated through the heater to increase its efficiency without waste and the cubic feet per minute of air is controlled by an adjustable slide collar fitted over the inlet of the fan.

The radiation of heat from the fine collector box at the extreme rear of the unit tends to heat the butane drum furnished by Petroleum Gas Co., of New Orleans and maintains a constant supply of fuel. The heater was furnished by Emmett A. Smith, of the Southern Heater Co., New Orleans.

### New Catalog Covers "Rotamatic" Controllers

A new catalog entitled, "Rotamatic-Automatic Flow Controllers," which is Section 51-B of a 200-page catalog that is being published in sections, has recently been issued by Fischer & Porter Co., Hatboro, Pa.

The Rotamatic controller is used

for automatic control and permanent chart record of liquid or gas flow rates, especially for measuring and controlling flows of viscous and corrosive fluids.

Copies of Section 51-B may be obtained without cost by addressing the company at 43 County Line Road, Hatboro, Pa.

### Ralph N. Brodie Co., Inc., Moves Dallas, Texas, Office

J. J. Kropp, Southwestern district manager of Ralph N. Brodie Co., Inc., manufacturers of Brodie meters, has announced the removal of the company's Southwestern office from 2815 Canton St. to 302 South Pearl St., Dallas. A complete field engineering service is maintained at the branch office. Also the latest models of Brodie meters with Brodimatic counters and ticket printers for LP-Gas service are displayed and demonstrated at the new address.

In addition to Mr. Kropp, Joe W. Ricker, Dallas representative, and A. W. McNeil, division field engineer, also operate from the Southwestern branch.

### C. V. Coons Becomes General Sales Manager for Rheem

C. V. Coons, Rheem Manufacturing Co., has been appointed general manager of sales of his company, effective with December 1941.

R. E. James and V. R. Woolsey have been appointed assistant general managers of sales and Frank J. Nugent has been named to the post of sales manager of the appliance division. Mr. Nugent has transferred his headquarters from Houston, Texas, where he has operated as southern sales manager for three years, to the Sparrows Point, Md., plant of the company.



*Designed with the aid of 615 home economists  
... just what women said they wanted!*

INCREASE YOUR LP-GAS  
BUSINESS WITH THIS  
*Magic Chef*  
**ALL-AMERICAN**

## A roomy family-size range ideal for LP-Gas Territories

**W**HEN a customer wants cooking capacity . . . plus modern efficiency and convenience, the Magic Chef "All-American" Gas Range is what she needs! Roomy cooking top, extra-size oven and high Swing-out Broiler that does double duty as a barbecue oven and warming compartment. Other new exclusive features. This is just one of many new

Magic Chef Gas Ranges in a wide range of prices. Our Research Laboratory pioneered in developing ranges for greatest efficiency with all types of LP-Gas. Magic Chef Ranges are backed by widespread national magazine advertising and intensive sales promotion campaign helps. The Magic Chef franchise is still available in some areas. Write now for details.

**THIS COUPON MEANS  
MORE BUSINESS . . .**  
*Send it today!*

AMERICAN STOVE COMPANY, Dept. B-5,  
4301 Perkins Ave., Cleveland, Ohio  
Please send me details of the complete Magic Chef line  
and merchandising helps available.

Name .....  
Company .....  
City ..... State .....

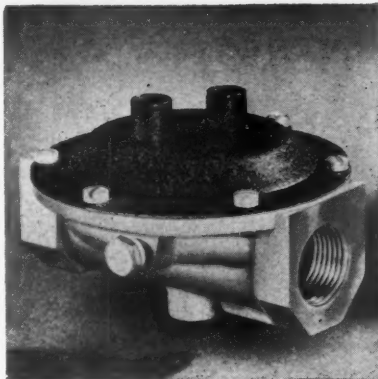
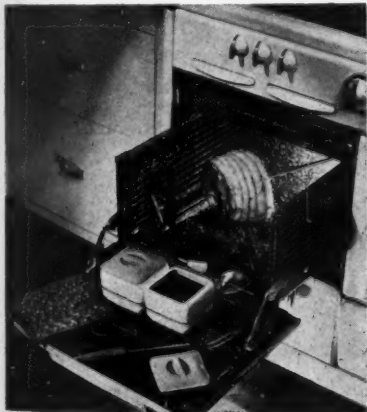
# PRODUCTS

## Broiler Barbecue

Geo. D. Roper Corp., Rockford, Ill.

Model: "Bar-B-Q."

**Description:** The new Roper broiler "Bar-B-Q" consists of complete equipment for barbecuing in the broiling oven. A skewer with support can quickly be placed in position, all ready to go. Used in combination with the "Glo" broiler burner of the modern Roper gas range, it provides a means of barbecuing conveniently and effectively. The "Glo" burner supplies a penetrating infra-red heat ideal for the barbecuing process that is penetrating and up to 30% faster. It permits charring meats, if desired. An easy-to-use device, the broiler "Bar-B-Q" may be quickly attached or removed from the broiler. The long skewer that will take 2½ lb. chickens or a large piece of meat—and a skewer support. These let you turn the meat every few minutes with a turn of the wrist.



## Diaphragm Gas Valve

General Controls Co., Glendale, Calif.

Model: Series B-101.

**Description:** Claimed to be the smallest and most compact fail-safe diaphragm gas valve, for successful operation where damper arm control is not needed, these valves are offered for standard I.P.S. as small as ½-in., and in all other sizes up to 3-in., inclusive. Listed as Series B-101, the new valves embody improvements on the original design listed as B-100. They include internal gas ways and interchangeable orifice as integral parts. The compact design makes these valves adaptable to any type of pilot valve, either direct, reverse or three-way, with positive ability to fail safe upon diaphragm rupture. The B-101 is available for all liquefied petroleum gases as well as natural gas. Maximum operating pressure limited by pilot valves up to 5 lbs. The full range of sizes covers capacities from 160 to 12,000 cu. ft./hr., depending on pressure drop and size of valve.



## Fryer

*J. C. Pitman & Sons, Inc., 711 Broad St., Lynn, Mass.*

*Model: No. 14.*

*Description:* Model No. 14 "Frialator" is manufactured with either the square or round fat container. The heat is applied through heavy tubes above the bottom so that the frying zone is at a temperature of 390°, and the bottom or space below the heating tubes, is kept at a temperature of 90 to 100°. This patented feature of applying heat above the bottom makes it impossible to burn the sediment. No. 14 size was developed as a general purpose "Frialator" for short order frying in restaurant, cafeteria, hotel, club, roadside stands, etc. Thermostatically controlled so fat will not get too hot or too cold. Construction prevents grease from boiling over. Maximum B.t.u. per hour, 32,100.

## Cylinder Valve

*The Bastian-Blessing Co., 4203 Peterson Ave., Chicago, Ill.*

*Model: RegO No. 2918.*

*Description:* This cylinder valve for internal combustion engines is provided with an SAE flare outlet connection, making it suited for use on internal combustion engines. In addition to functioning as a shut-off valve, it also is provided with an excess flow check valve as an integral part of the inlet connection. The purpose of the excess flow valve is to prevent excessive discharge of fuel to atmosphere in the event of a pipe, tubing or connection failure.



## Domestic Range

*Crown Stove Works, 4627 W. 12th Place, Chicago, Ill.*

*Model: 235-24.*

*Description:* This model is the deluxe divided top gas range in the Crown line for 1942. Designed to give years of satisfactory service. It has a one-piece streamlined cooking top. Even-heat oven with heat control;



hi-lo simmer top burners; safety non-tilt oven racks, pedestal base, flush-to-wall construction. Oven 16x13½x20 in. Floor space 38x26 in.

# BANKS TANKS DOMINATE

## On The Assembly Line



By

W. W. BANKS

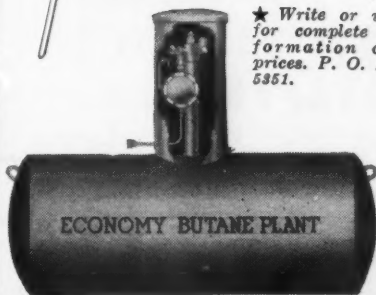
*We Grow  
with the  
Industry!*

As we review the figures for 1941 it is very gratifying to note the biggest annual gain in the comparatively brief but meteoric history of the industry. Sales for L.P. Gas show an increase of 38% over the preceding year! 380,000 new consumers! Range sales up 60%! Total gallonage 423,144,000! As the industry has grown, we have grown, constantly enlarging our plant and facilities to keep pace with a fast-moving industry.

Our business, like many another, undoubtedly will be affected by the requirements of our national emergency. National defense comes first! We pledge you that we shall do our utmost, under the prevailing circumstances, to serve our dealers everywhere as completely as conditions permit.

## We Manufacture All Types of Tanks

In addition to Economy Butane Systems we manufacture all types of Truck Tanks, Bulk Storage Tanks, Skid Tanks, Butane Motor Fuel Tanks, Smoke Stacks, Breechings, Steel Plate Fabrications. We are distributors for Scaife Cylinders, and Tru-Flame Butane Gas Ranges.



★ Write or wire for complete information and prices. P. O. Box 5951.

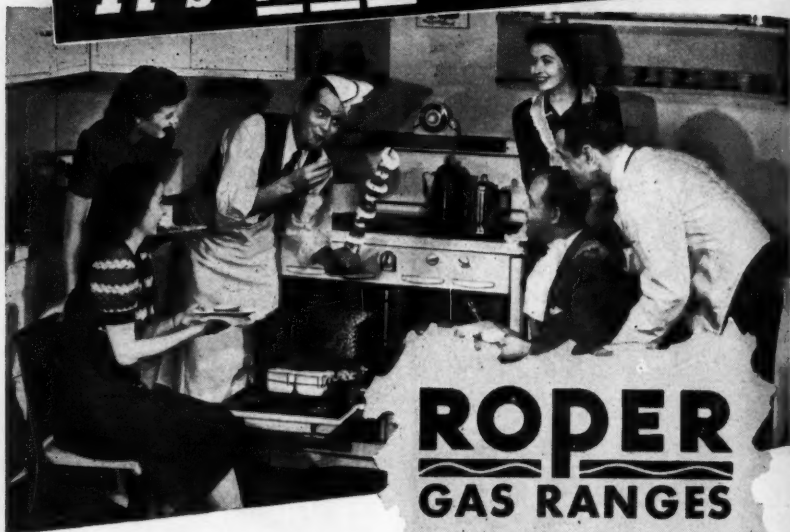
# DALLAS TANK

AND  
WELDING COMPANY, INC.  
201-5 W. COMMERCE ST. DALLAS, TEXAS

FEBRUARY-1942

79

**It's NEW for '42**



*Featuring the*  
**NEW BROILER  
BAR-B-Q**

The new Roper "Broiler Bar-B-Q" gives you one of the finest features to demonstrate. It provides a cooking performance check-full of perfect enjoyment. It romances the idea of "A Picnic in Your Kitchen." See the Roper Gas Range with its host of star-studded features.

**GEO. D. ROPER**  
CORPORATION

GENERAL SALES OFFICE AND PLANT: ROCKFORD, ILL.

**ROPER**  
**GAS RANGES**

*Present*  
**"A PICNIC IN  
YOUR KITCHEN"**

*See these Featured Stars*

- ☆ "Staggered Top"
- ☆ "Peasant-Ware" Grill
- ☆ "Lifetime" Cooking Chart
- ☆ "3-in-1" Oven
- ☆ "Glo" Broiler
- ☆ "Simmer-Speed" Burners



**ROPER GAS RANGES FOR ALL GASES INCLUDING (LP) LIQUEFIED PETROLEUM GAS**



# RESEARCH

**BUTANE-PROPANE** News wishes to keep its readers informed regarding technical and practical advances concerning research, manufacture, development, and transportation in the liquefied petroleum gas field. In this column will be found a resume of recently published articles, papers, bulletins and books dealing with the industry's various phases.—Editor.

**High Octane Aviation Gasoline**—J. C. Morrell and Gustav Egloff. *Petroleum World*, Annual Review, 1941, pp. 260, etc. A description of technical processes for the production of 100-octane fuel is timely in view of the recommendation of Petroleum Coordinator Ickes in September, 1941, that producing capacity be trebled.

**Big Year Ahead for Natural Gasoline**. *Petroleum World*, Annual Review, 1941, pp. 300, etc. California casinghead manufacturer is furnishing two hydrocarbons vital to national defense; Cycling plant, pressure maintenance programs and plant modernizing should bring year's expenditures to well over \$5,000,000.

**Improved Motor Fuels Through Selective Blending**—C. R. Wagner, W. B. Ross, L. M. Henderson, and T. H. Risk. *Refiner*, Nov., 1941, pp. 80, etc. This paper is a report of the progress that has been made in a program begun in 1938 to investigate the effect of the chemical composition of fuels on the road anti-knock performance and road lead susceptibility of these fuels. The data presented are based on the results of road tests of some 284 special fuel blends and approximately 200 commercial gasolines in 25 different cars. The borderline road-knock testing method was used throughout these tests, as it seemed best adapted to a study of fuels in accordance with the arbitrary definition of the "ideal" fuel set up at the

start of the investigation. As defined for the purpose of these tests, an "ideal" fuel is one which will satisfy the anti-knock requirements of any engine in which it is used throughout the engine-speed range, but which will not possess any "wasted" or excessive anti-knock quality at any car speed. The results obtained to date indicate that the fuel which most nearly will satisfy this definition of the "ideal" fuel is one in which the light fractions are composed primarily of olefinic material and the heavy fractions are composed primarily of paraffinic material. Several ways of utilizing this information in the commercial production of motor fuel are suggested. An A.P.I. paper.

**Response of Aircraft Fuels to Tetraethyllead**—A. G. Cattaneo and A. L. Stanly. *Industrial and Engineering Chemistry*, Nov., 1941, pp. 1370-1373. The Ethyl blending chart for evaluating lead response of gasolines in the A.S.T.M.-C.F.R. engine has been extended into the region above 100 octane number. The extension is consistent with the original chart in that the line representing the response of a given fuel is continuous and of constant slope throughout its length. The extended chart permits a quantitative measure of lead susceptibility throughout the range from 0 octane number to isooctane plus 3 cc. of tetraethyllead per gallon.

**Precise Commercial Fractionation in 1000 Barrel Steadman Units**—L. B. Bragg and F. Morton. *National Petroleum News*, Nov. 12, 1941, pp. R-355-358. This paper describes the design and operation of a commercial fractionating unit utilizing a Stedman packing filled column 12 ft. in diameter and 16 ft. high, containing 7 ft. of packing. The plant consists of a

batch still installed in the refinery of the Trinidad Leaseholds, Ltd., Trinidad, B.W.I. The results show that narrow boiling fractions can be obtained with a high degree of separation from large diameter and short height columns filled with Stedman packing. Stedman packing is claimed to have particular application in fractionation when a large number of theoretical plates is required, since each foot of packing is equivalent to four theoretical plates. One set of data indicates that a naphtha cut (212-273°F.) might be separated to provide one fraction (219-250°F.) containing 34% of toluene (B.P. 231°F.). An A.P.I. paper. Also in *Refiner*, Nov., 1941, p. 101.

**Gas Explosions in Buildings: Their Cause and Prevention**—D. J. Parker and C. W. Owings. 32 pp. Explains properties of natural and manufactured gas, describes gas explosions at various post office and school buildings in United States, and makes recommendations in each case. Bureau of Mines, Washington, D. C., Information Circular No. 7142R. A revision and enlargement of I. C. 7142, issued in December 1940.

**Application of Gas Fuel to Heating Boilers**—R. L. Grutzmacher. *Heating, Piping and Air Conditioning*, Oct., 1941, pp. 659-665. The use of gas for heating boilers is not new. The problem of burner design and application have been discussed in other reports. For purposes of this discussion, the developments of burners are summarized to emphasize the relationship of burner design and arrangement to automatic control.

**Alternative and Auxiliary Fuels from Liquefied Petroleum Gases**—C. G. Segeler. *Oil and Gas Journal*, Oct. 23, 1941, pp. 41, etc. Employment of liquefied petroleum gases as a substitute for natural or manufactured gas during peak load and emergency periods and problems arising from its use are summarized.

**Supercharging of Four-Cycle Diesel Engines.** *Diesel Power*, Oct., 1941, pp. 848, etc. Supercharging of Diesel engines is merely the delivery of a greater weight of air into the engine cylinder than would normally be forced into the cylinder by the atmospheric pressure, during the engine's suction stroke. Various methods of supercharging have been developed. These are: (A) Reciprocating type compressor either driven by the engine itself or separately driven by electric motor; (B) Turbo-blower, driven by exhaust gases; (C) Blower, chain or gear driven by the engine itself or separately driven by electric motor; (D) Utilization of the working pistons in crosshead type engines by sealing the lower end of the cylinder and fitting compressor valves; (E) Intake pipe of a length such that inertia charging is obtained; (F) Inlet-valve setting to induce greater velocity of air and, consequently, utilizing the kinetic energy to increase the air volume. These various methods are briefly described. The following abstracts of papers on this subject are given: Problems and Possibilities of Mechanical Supercharging of Diesel Engines, by H. L. Knudsen; American Experiences with the Buchi Turbo-Charging System, by J. P. Stewart, Ralph Boyer, and J. W. Anderson; Operation of Supercharged Engines in Pipe Line Service, by J. B. Harshman; Test Results with Under-Piston Supercharging, by E. S. Dennison and W. A. Morain; Supercharger Designs.

**Efficient Gasoline Production from Illinois Field**—W. H. Gottlieb. *World Petroleum*, Nov., 1941, pp. 32-35. Diversion of oil tankers to Britain and Russia and the threatened gasoline shortage in the eastern states, has caused oil fields and gasoline plants nearest the east, particularly those that ship their product by rail, to take on increased importance. Newest of the gasoline plants in the Centralia-Salem field of southern Illinois is the Warren Petroleum Corp.'s stripping

plant in the northwest section of the field, just six miles from Salem. Handling 18,000,000 cu. ft. of casinghead gas gathered from 571 wells during each 24-hour period, the plant has recorded a daily production of 950 bbl. of gasoline, 20,000 gals. of butane, and 10,000 gals. of propane. The principal power job of compressing the incoming gas from a suction vacuum of 9 in. to a discharge pressure of 40 lbs. is accomplished by five 400-hp. Clark gas engine-compressor units of the modern angle type. Described and illustrated.

**Units and Conversion Factors for Absolute Viscosity**—G. A. Hawkins, H. L. Solberg, and W. L. Sibbitt. *Power Plant Engineering*, Nov., 1941, pp. 62-65. Even a casual survey of literature in heat transfer, fluid mechanics, hydraulics and related fields reveals that many different combinations of units are employed in this country and abroad for expressing the concept of absolute viscosity. It is often necessary in the solution of engineering problems to transfer from one system of units to another and it is important that the engineer be able to do this accurately and rapidly. Therefore data are presented which will be of help to the practicing engineer confronted with the use of absolute viscosity in the solution of problems.

**Know Fire—To Put It Out**—H. W. Lange. *Power*, Oct., 1941, pp. 72-74. With industry "all out", fire losses will increase unless extra care reverses the usual trend. The author, a fire protection engineer, shows how fires differ and how to fight each kind.

**Latent Heats of Vaporization**—H. P. Meissner. *Industrial and Engineering Chemistry*, Nov., 1941, pp. 1440-1443. If the critical pressure and critical temperature of a pure liquid are known, its molal latent heat of vaporization at any temperature can be computed from vapor pressure data alone by the equation shown.

**Improving the Lubrication of Gas Engines**. *Lubrication*, Oct. 1941, pp. 109, etc. Good lubrication of a gas engine implies reasonable freedom from wear and carbonaceous deposits. To bring about this desirable condition, more than the correct application of the proper lubricant is required. Air and gas entering the engine must be free from injurious substances and mixed in the proper proportions. The mixture must be fired at the right moment and the heat generated carried away by efficiently operated cooling and exhaust systems. The modern gas engine is a well designed and sturdily constructed machine, and if the operator keeps the load and speed within the range for which the engine was designed, carefully controlling the conditions just enumerated, good lubrication should result. The January, 1937, issue of "Lubrication" described the fundamentals of gas engine lubrication—this article is chiefly a discussion of the many related maintenance problems.

**Elements of Orifice Meter Operation and Maintenance**—J. W. J. Bercher. *Petroleum Engineer*, Nov., 1941, pp. 86, 88. Part 1. Designed specifically to aid in training chart changers and plant operators in the development and use of orifice meters, this practical discussion of gas measurement should prove interesting to engineers and others as well.

**How to Make a Simple Diesel Smoke Meter**—P. H. Schweitzer. *Power*, Nov., 1941, p. 72. Smoky exhaust means high fuel consumption and troublesome soot deposits. The author describes an easily made meter to take the guess out of smoke observation.

**62 Million Gallons of Toluene Yearly for National Defense**—O. W. Willcox. *World Petroleum*, Annual Refinery Issue, pp. 57-59. Oil industry plans to furnish explosive sufficient for 4600 rounds of 16-inch rifle ammunition per day from toluene units.

## Trade Allowances Influence Sales

**O**FTEN, LP-Gas dealers lose many good sales through failure to take in old wood, coal, gasoline and oil burning appliances at fair allowance prices, believes Joe W. Blickenstaff, owner of the Automatic Gas Appliance Co., of Oklahoma City, Okla.

Mr. Blickenstaff, who is local dealer for Oklahoma Automatic Gas Co., LP-Gas distributors, and also of Oklahoma City, operates his

appliance sales business in seven counties in the vicinity of Oklahoma City. "I seldom encounter any difficulty in disposing of old appliances acquired in connection with sales of LP-Gas appliances and equipment," said Mr. Blickenstaff. "I place advertisements regularly in classified columns of newspapers in my territory. These, in connection with efforts of my appliance salesmen, enable me to sell most of such appliances at fair prices.

"Householders often hesitate to change over from older heating methods to LP-Gas if they are not offered an opportunity on the spot to sell their old appliances at fair

# How to cut LP-Gas losses

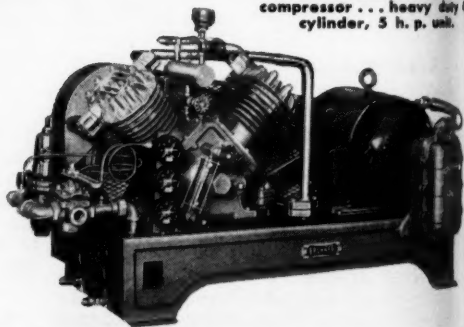
## 500 to 1000 lbs. PER TANK CAR

### BRUNNER

#### LP-Gas unit speeds up tank car unloading and reduces gas loss

Because LP-Gas is a housing necessity in many defense areas, handling equipment that will be made available must be dependable. Brunner LP-Gas self-contained compressor units are a self-liquidating investment that pay for themselves from savings in gas recovered from tank cars unloaded. Brunner units conserve man-power by reducing the time required to unload tank cars. Safe, efficient and economical, Brunner is the answer to liquid petroleum gas handling problems. Brunner Manufacturing Co., Utica, N. Y., U. S. A.

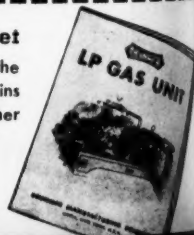
Brunner LP-Gas self-contained compressor . . . heavy duty 1 cylinder, 5 h. p. unit.



**FOR OVER 30 YEARS  
THE SYMBOL OF QUALITY**

#### Write for FREE Booklet

The new booklet describes the Brunner LP-Gas Unit, contains illustrations, diagrams and other pertinent facts on handling liquid petroleum gas.



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prices. They have quite a large investment in these old stoves, ranges and water heaters and often are not willing to carry them into the backyard or risk getting only junk value out of them," Mr. Blickenstaff declares.

#### Friends and Future Prospects

"Besides," he adds, "you are making friends and building future prospects. First, you make a friend of the one to whom you allow a fair price for old appliances and which are replaced with the far more efficient ones burning LP-Gas. Then, when you sell the old ones at a fair price to families not yet ready for the more modern fuel, you create a friendly feeling for

your firm and at a later date you will have the inside track for another and larger sale."

#### Meet Used Appliance Demand

While at this time he is successful in selling most of the old appliances acquired as trade-ins, Mr. Blickenstaff believes that increasing scarcity of certain materials going into the manufacture of new appliances, and possibly of rising costs, will create an increasing demand for used appliances. If LP-Gas dealers are ready, they can better serve the public, and themselves, by meeting such demands, at the same time clearing the way for the sale of more new liquefied petroleum gas equipment and appliances.

# Warren LP - Gas

## Answering the Increasingly Important Call for 100 Octane Aviation Gasoline

Today, when war makes Warren Butane and Propane vital necessities, the Warren organization is placing its expert chemists, facilities and resources solidly behind America's united effort.

Since 1922 Warren Petroleum Corporation has always faced the future with confidence, vision and courage. The kind of confidence that has provided our own fleet of tank cars, adequate storage, loading facilities and several terminals strategically located. Vision that has placed 18 plants in 7 states. And courage to maintain the high quality of our products while meeting the demands of our government and our customers. Warren Petroleum Corp., Tulsa, Oklahoma.



### **W. L. Elkin and C. G. Berry Dissolve Partnership**

W. L. Elkin and C. G. Berry, who for the past two and one half years have operated Butane Consolidated, of Oklahoma City, Okla., as a partnership have dissolved partnership.

Mr. Elkin retains ownership and management of Butane Consolidated, with the same headquarters. Mr. Berry has organized Eastern Butane Consolidated, with headquarters at Tahlequah, Okla. There is no connection between the two firms, Mr. Elkin said.

Butane Consolidated has taken over the Oklahoma state agency for Hydrogas Systems, manufactured by Southern Steel Co., of San Antonio,

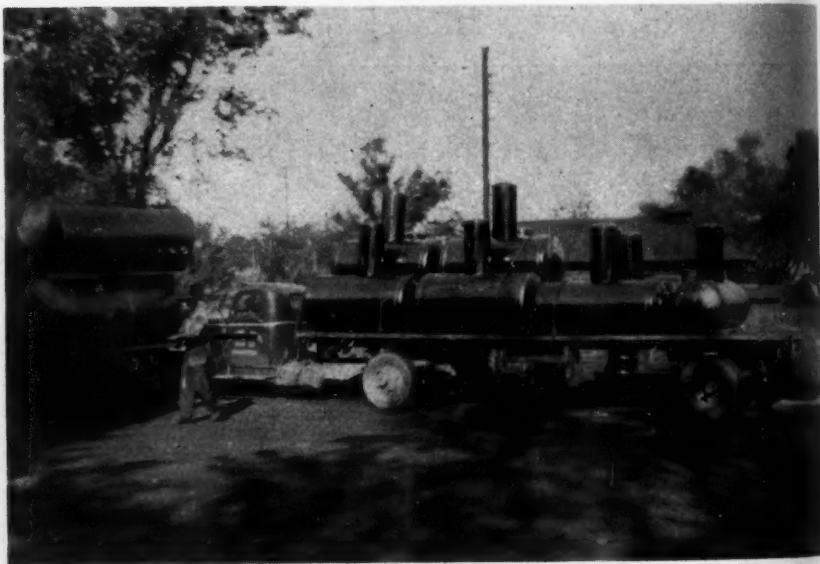
Texas, according to Mr. Elkin. He is handling tanks for this company with capacities ranging from 150 gals. to 1114 gals.



### **F. Hennessey Concentrates On Butane in San Jose, Calif.**

Frank Hennessey, former operator of a trucking company and representative of an LP-Gas company in San Jose, has sold his trucking business and will devote his time to the distribution of butane gas.

His entire plant, on Monterey road, will be used for the sale and distribution of the gas for domestic and commercial purposes and for the sale and installation of LP-Gas appliances.



The U. S. Government orders underground propane tanks! These propane underground gas systems are headed for defense housing projects being installed by the Rulane Gas Co., Charlotte, N. C. They were manufactured by the General Steel Tank Co. and sold by the Southern Gas and Equipment Co., of Little Rock, Ark., and Birmingham, Ala.



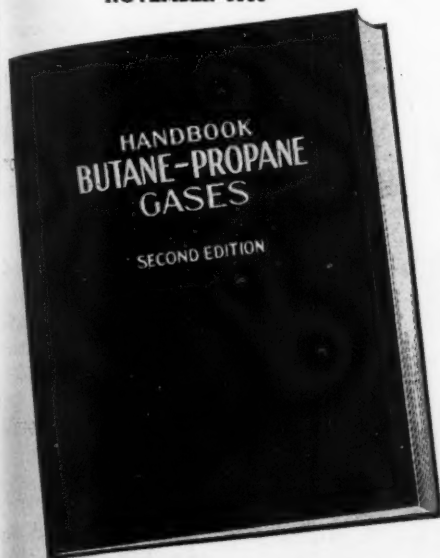
# Handbook BUTANE-PROPANE GASES

LATEST REVISION  
NOVEMBER 1938

SECOND EDITION

415  
Pages

\$5.00  
Plus  
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CONTENTS: Semi-Bulk Distribution: Use of Butane in Buses: Combination Propane Operated Utility Plant: Use in Internal Combustion Engines: Design & Installation of Storage: Supply from Petroleum Refineries: Engineering Data on the Lower Olefins: Domestic Appliance Testing and Utilization: Economical Comparisons with Coal, Oil, Electricity, Producer Gas, Manufactured Gas: Town Plants: Manufacture from Natural Gas: Special Uses: Volume Correction Factors: Transportation: Use with Other

Gases: Analysis & Testing: Properties of Mixtures: Bottled Gas Distribution: Bibliography: Central Plant Directory: Catalog Section.

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*News*

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FEBRUARY-1942

87

**ROBERTSHAW MANUALS**  
will help increase your sales



**FOR DOMESTIC SALESMEN**

*"More Income from Gas Ranges"*

How can your salesmen sell more gas ranges? This manual shows simply, graphically, convincingly. Thousands of salesmen have greeted it with enthusiasm, are putting it to effective use.

**FOR COMMERCIAL SALESMEN**

*"Hidden Losses in Your Kitchen and How to Stop Them"*

The latest developments in commercial gas cooking equipment are brought together in this manual, now used by many bottled gas dealers.



Write for free copies

**ROBERTSHAW THERMOSTAT COMPANY**  
YOUNGWOOD, PA.

**IN TEXAS IT'S**

**THE BUTANE COMPANY**

for  
**WHOLESALE DELIVERIES  
DIRECT TO YOUR BULK  
STORAGE PLANT.**

**the BUTANE Company**  
• BROWNWOOD, TEXAS

WHOLESALE TRANSPORTERS—DISTRIBUTORS OF BUTANE

# Propane Blows Warning Horn

**L**IQUEFIED petroleum gas found a new job in national defense last month when Long Beach, Calif., installed a number of propane cylinders to be connected to pressure horns for air raid warnings.

The large 16-in. horns, mounted in groups of three, sound very much like those on streamlined trains and can be heard clearly for many blocks. One important feature, authorities state, is that the sound coming from the horns is distinctive and cannot be confused with an emergency vehicle siren.

The first installation was made on top of the central fire headquarters. Fourteen other triple-speaker devices have been mounted at fire stations and other vital points throughout the city.

## Propane Works Best

Initial experimentation and installation of the LP-Gas system were made by the Petrolane Co., of Long Beach. The fuel used in this work was predominantly butane which proved inadequate when the horns were operated for long periods of time. Recommending propane, this company turned the job of delivering fuel over to the Imperial Gas Co. of Los Angeles, suppliers of "Rockgas."

Representatives of the Rockgas company state that propane, supplied in 210-lb. cylinders, provides sufficient pressure at all times to

++ ++ ++ ++ ++ ++ ++ ++ ++ ++ ++

Why your Red Cross now needs

# FIFTY MILLION DOLLARS

Every dollar that you give now to your Red Cross marches into the thick of things where humanitarian help is needed most — up to the fronts and battle stations where the fighting is heaviest. And throughout our broad land to train and equip volunteers to meet any emergency that may strike.

## How this War Fund is Used

### SERVICE TO THE ARMED FORCES • • • \$25,000,000

Provides for the care of the Army and Navy, including services to men in hospitals and during convalescence. • Provides an important link between the service men and their families. • Provides essential medical and other supplies outside of standard Government equipment. • Operates Red Cross headquarters at camps and naval stations. • Enrolls blood donors and medical technologists for Army and Navy needs. • Provides millions of surgical dressings, sweaters, socks, etc., through volunteer workers.

### DISASTER AND CIVILIAN EMERGENCY RELIEF \$10,000,000

Supplies emergency needs for food, clothing, shelter and medical attention for disaster victims. • Assists stricken families in repair of homes and other adjustments; provides minimum reserves of essential relief supplies to prevent unnecessary delays.

### CIVILIAN DEFENSE SERVICES • • • • \$ 5,000,000

Trains volunteers for home nursing and nurses' aides. • Trains nurses, men and women, for active duty with the Army and Navy. • Trains volunteers in First Aid and accident prevention, in Motor Corps, Canteen and Production. • Organizes for evacuation of children and their families from stricken areas. • Assists Red Cross Chapters in establishing effective coordination of emergency relief.

### SERVICE AND ASSISTANCE THROUGH CHAPTERS • • • • • \$ 4,000,000

Gives assistance and service to the 3,740 Red Cross Chapters with their 6,131 Branches responsible for local Red Cross activities.

### OTHER ACTIVITIES AND CONTINGENCIES • \$ 6,000,000

New activities made necessary by unexpected developments.

### TOTAL • • • • • \$50,000,000

## THE AMERICAN RED CROSS \$50,000,000 WAR FUND

Use this material to better inform contributors how their donations are being expended.

Space for this advertisement is donated free to the American Red Cross by the publishers of BUTANE-PROPANE News.

FEBRUARY - 1942

89

**NATIONAL**  
*Thermo-Syphon*  
**SYSTEM**

and

*National Automatic Gas*  
**SYSTEM**

Patented Systems  
Protected Territories

*Write or Phone*

**National Butane Gas Co.**  
MEMPHIS, TENNESSEE

**BU-PRO-FIRE**

★  
HEATERS AND  
FLOOR FURNACES  
FOR L. P. GASES



Bu-Pro-Fire Heaters and Floor Furnaces are designed and built especially for use with liquefied petroleum gases. Every Model is finished in "Lifetime" Porcelain Enamel and is guaranteed to give satisfactory Heating Service. A wide range of sizes provides a Model for every heating need. A. G. A. Approved. Write for illustrated catalog and prices.

**TENNESSEE ENAMEL MFG. CO.**  
Nashville, Tennessee

blow the horns for an extended period. Air raid regulations demand that the systems be capable of operating the horns for three blasts of three minutes each.

This would be possible, it is stated, even in below-zero temperature as propane will maintain a 70-lb. pressure at zero degrees. Horns in the Long Beach system will operate satisfactorily at a pressure as low as 40 lbs.

#### Costs Little to Blow

Firemen in charge state that tanks and lines will be tested daily. The entire system is extremely simple and inexpensive. It includes an ICC bottle, a 2-in. nipple, a gate valve, a whistle valve and the horn. The gate valve, connected to the nipple, is used as a shut-off to prevent gas escaping when the bottle is removed for a refill. The whistle valve is manually operated and is in no way dependent upon electricity or other power. The propane gas escapes through the horn into the atmosphere. As all installations are usually made at the top of towers or high buildings, there is little danger of escaping gas causing damage.

The use of LP-Gas for air raid warning purposes in other cities and towns is being considered by officials. Already the Long Beach installations have drawn many firemen and police from neighboring cities to investigate the plan. It has also been suggested that similar units can be attached to existing domestic installations throughout the rural areas, making it possible to warn residents of possible air raids.



## INVESTIGATE! SPRAGUE No. 0

a NEW, SMALL meter designed specifically for the measurement of L-P Gases. Rugged, made of cast iron, and simplified in construction. Delivers at  $\frac{1}{2}$ " W.C., 60 cu. ft. Propane, 55 cu. ft. Butane.

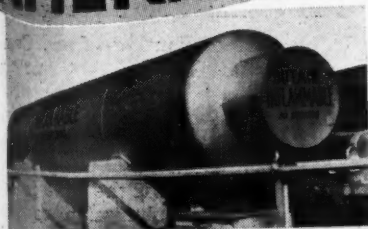
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**SPRAGUE METER CO.**

**BRIDGEPORT, CONN.**

DAYTON, OHIO • HOUSTON, TEXAS • LOS ANGELES, CAL. • SAN FRANCISCO, CAL. • ST. LOUIS, MO.

# Save ON INSTALLATION AND OPERATING COSTS *with* AMERICAN L.P.G. TANKS



They give more efficient service over a longer period of time. Built by expert craftsmen from designs by our own engineering staff, American Butane and Propane Tanks are better in construction, workmanship and materials.

American Engineers stand ready now for consultation on your future needs and problems... no obligation.

**AMERICAN PIPE AND STEEL CORP.**

*Manufacturers and Distributors*

ALHAMBRA

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**NATIONAL**  
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**SYSTEM**

and

*National Automatic Gas*  
**SYSTEM**

Patented Systems  
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MEMPHIS, TENNESSEE

**BU-PRO-FIRE**

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HEATERS AND  
FLOOR FURNACES  
FOR L. P. GASES



Bu-Pro-Fire Heaters and Floor Furnaces are designed and built especially for use with liquefied petroleum gases. Every Model is finished in "Lifetime" Porcelain Enamel and is guaranteed to give satisfactory Heating Service. A wide range of sizes provides a Model for every heating need. A. G. A. Approved. Write for illustrated catalog and prices.

**TENNESSEE ENAMEL MFG. CO.**  
Nashville, Tennessee

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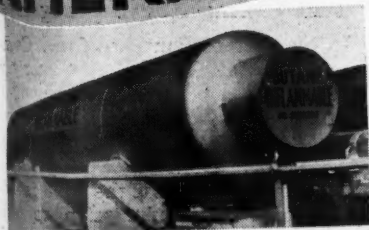
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# Save ON INSTALLATION AND OPERATING COSTS *with* AMERICAN L.P.G. TANKS



They give more efficient service over a longer period of time. Built by expert craftsmen from designs by our own engineering staff, American Butane and Propane Tanks are better in construction, workmanship and materials.

American Engineers stand ready now for consultation on your future needs and problems... no obligation.

**AMERICAN PIPE AND STEEL CORP.**

*Manufacturers and Distributors*

ALHAMBRA

CALIFORNIA

# ANSWERS

## To Chapter 8 The Bottled Gas Manual

Here are the answers to the questions on Page 55 and which refer to problems in Chapter 8 of THE BOTTLED GAS MANUAL:

1. Directly proportional.
2. Proportional to the square of the relative velocities.
3. Proportional to the square root of the specific gravity.
4. Four times as much.
5. 0.55 in. of water column.
6. Pressure drop, inches of water column.
7. Three feet.

*For Safety  
and Economy*

## ETHYL MERCAPTAN

—Purified—

The **ACCEPTED**  
standard  
odorant  
for liquefied  
petroleum  
gases.

**MALLINCKRODT  
CHEMICAL WORKS**

ST. LOUIS

NEW YORK

8. Formula is  $d^5 = Q^2 L$

659344

$Q^2 = 22 \times 22 = 484$

$L = 1350/3 = 450$  yds.

Substituting values:

$d^5 = (484) (450) = 217800 = .330$

659344 659344

Consulting table on Page 50, .330 is more than .2293 and less than .3799, therefore 1-in. Type K copper tubing should be used.

9. Household regulators should be used at each floor level.
10. POL connections, ground joints, flare connections, sleeve connections.



**E. A. Nelson is Home Gas Co.  
Distributor in Willmar, Minn.**

E. A. Nelson, has accepted the dealership and managership of the newly-established Willmar Home Gas Store, Willmar, Minn., which is located at 320 Benson Ave. Mr. Nelson recently resigned as manager of the Willmar Gas Co.

The Home Gas Co., with headquarters in Minneapolis, also operates plants in Mankato, Hutchinson, Sauk Center, and Montevideo, Minn., Fargo, Carrington, N. D., and Merrill, Wis.



**Patent Claims Held Aggregative**

In the case of Southern Steel Company vs. Butex Gas Co., et al, certain claims of U. S. Letters Patent No. 2,121,675 have been held aggregative by The U. S. Court of Civil Appeals, Fifth Judicial District.

It is understood that the case is being prepared for submission to The United States Supreme Court for final adjudication of the issues involved.



**Beauty**  
**FOR EYE APPEAL**  
**Economy**  
**FOR PURSE APPEAL**

With one look this Vesta Range is already half sold. Gracefully proportioned, sparkling white with just a touch of gleaming chromium in door handles and oven controls, the beauty of this range wins the immediate approval of the most discriminating housewife. And the economy in cooking and cleaning time, in fuel and positive cooking results, is the final assurance of customer satisfaction.

**VESTA**  
**LP-Gas Ranges**

No. 41-PD-8123-X (illustrated)  
Baking Oven.....14 $\frac{3}{4}$ "x18"x19 $\frac{1}{2}$ "  
Broiler.....7 $\frac{1}{4}$ "x18"x17"  
Sum of Cooking Top.....9 $\frac{1}{4}$ "x18 $\frac{3}{4}$ "  
Height to Cooking Top.....36"  
Floor Space.....36"x26"  
Shipping Weight, Approx.....250 lbs.

**ATHENS STOVE WORKS, INC.**  
ATHENS, TENNESSEE

**For a More DEPENDABLE  
SOURCE of SUPPLY . . .**

. . . of Higher Quality Butane and Propane—for a Stable and More Uniform Product—assuring the utmost in satisfaction and efficient, trouble-free service—try Carter Better Products.

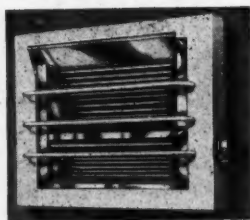
For complete information concerning Carter's dependable service write: The Carter Oil Company, Marketing Department, Room 928 National Bank of Tulsa Building, Tulsa, Okla.

DEHYDRATED  
**Propane and Butane**  
**THE CARTER OIL COMPANY**

TULSA, OKLAHOMA  
Shipping Points: Seminole, Okla., Stonewall, Okla., St. Elmo, Ill.  
**WHOLESALE ONLY!**

## EXTEND THE HEATING SEASON

SELL  
RAFIRE  
WALL  
Heaters



HUMPHREY RAFIRE No. 2

Used daily, even in mild weather, for bathrooms and chilly, hard-to-heat spots, the Humphrey Rafire Wall Heater No. 2 adds a payload of 7500 Btu per hour.

Sell this attractive, easy-to-install heater for handsome first profits, too. Send for full details.

**GENERAL GAS LIGHT CO.**  
KALAMAZOO, MICHIGAN

## HOTSTREAM "V" LINE



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- ★ Porcelain enameled
- ★ 15, 20, 30, 40, 60 gallon capacities
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No gaskets used
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Accepted F.H.A.,  
U.S.H.A., P.B.A.,  
War Department

★ Guaranteed 20 years

**Deliveries at Once**

**THE HOTSTREAM  
HEATER COMPANY**

8007 Grand Avenue • Cleveland, Ohio

## Housing Authority Installs 151 Crown Ranges in New Project

The United States Housing Authority has recently equipped one of its housing projects at Savannah, Ga., with 151 Crown ranges, manufactured by the Crown Stove Works, of Chicago. This marks the twelfth installation of a similar nature that the Government has made with Crown ranges.

These ranges are the heavy duty, kitchenette type and equipped to burn undiluted butane.

The Savannah project is served by a central plant from underground pressure tanks, with the gas distributed through pipe lines to the individual units, and the contract was made through the Ideal Gas Co., Inc., of Savannah.



## White Gas Co. Purchases Hydrogas Franchise

The White Gas Co., Port Arthur, Texas, distributors of liquefied petroleum gas and appliances, has recently purchased the Hydrogas franchise from the Pittsburgh Heater Co., of Port Arthur.

Bryan White, proprietor of the firm, was formerly associated with the Southern Steel Co., and the Edwards Gas Appliance Co., both of San Antonio, Texas.



## Butane Gas Tank Bans Defeated

A motion by Commissioner Robert J. Bauer, of Los Angeles, that all installations of butane gas tanks in the city be banned as a fire-prevention measure recently failed to carry after the Fire Commission was informed that all aircraft plants, and most of other large defense industries have such tanks for stand-by use in case of any gas shutoff.

**BUTANE-PROPANE News**



FOR  
*Smooth*  
SAILING  
SPECIFY

## ANCHORGAS

Prompt attention to every order and carrying out contracts as agreed has earned for us a good reputation. There is much satisfaction and profit in handling Anchorgas, a high quality, dependable fuel.

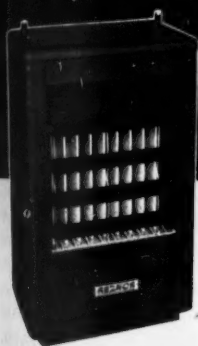
There is smooth going in 1942 for those who tie-up with Anchor as a dependable source for Butane-Propane.

Anchorgas is favorably known and gaining more friends every day. Our chief business is the production, manufacturing and distributing of Butane-Propane wholesale.

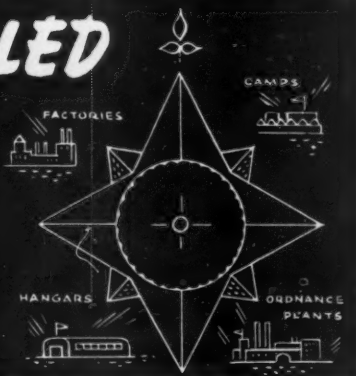


**ANCHOR**  
PETROLEUM COMPANY  
Atlas Life Bldg. Tulsa, Okla.

**EASILY INSTALLED**  
*Anywhere...*



**REZNOR  
SUSPENDED  
GAS UNIT  
HEATERS**



Three types and nine sizes of Reznor Suspended Gas Unit Heaters are meeting industrial needs everywhere. Only gas and electric lines are necessary. Hence, no other type of installation is so quick. Industry needs this speed.

*Write for catalog today.*

**REZNOR MANUFACTURING CO. 304 James St. Mercer, Pa.**

"GAS HEATERS EXCLUSIVELY SINCE 1888"

FEBRUARY-1942

# Bombings Set Cylinders Adrift

**E**IGHT thousand dollars worth of liquefied petroleum gas in 20-210-lb. containers, bearing the imprint "Rockgas", product of the Imperial Gas Co., Los Angeles, are afloat somewhere in the wide Pacific, victims of Japanese bombings early in December which sunk the S. S. Manini, according to A. N. Kerr, industry pioneer.



A. N. KERR

The exact point where the vessel was attacked is not known but reports did state that prevailing currents were causing the cylinders to drift toward the South Seas where it is possible many of them may later be recovered by Rockgas dealers who are stationed on some of the islands. In any event, the entire shipment is completely covered by insurance.

Four dealers of Mr. Kerr's company in the Hawaiian and Philippine Islands suffered from aerial bombings lately. The plant of the Honolulu Gas Co., in Honolulu, was badly damaged, as also were dealers' plants in Manila and Cebu. Manuel Quezon, president of the Philippines, had an LP-Gas installation for his home at Baguio, and reports say that it was destroyed.

This is not the first time that

Rockgas cylinders have navigated the Pacific on their own. Recovery of cylinders which were washed overboard in heavy seas, has occurred at least twice in the past. Ten years ago 30 were lost from a ship in the North Pacific and later drifted ashore on Oregon's coast, and 48 were cast up on the beaches of Formosa island after an Asiatic typhoon had broken them loose from their lashings on the deck of a floundering ship.



## May Pump Water with Butane Near Beaumont, Calif.

In Beaumont, Calif., recently a hearing on pumping one well of the Beaumont Irrigation District with natural gas and two canyon wells with butane gas was held by the city's board of directors.

The meeting was called for the purpose of hearing a proposition of the Southern California Gas Co. which proposed the installation of gas engines instead of electric power for pumping water.

E. K. Snidercore presented the findings of the gas company engineers which were based on the experience of electric energy used, efficiency of pump tests and gas consumption of 10 cu. ft. per B.H.P. for one of the district's wells. Engineering data for equipping the other wells with butane gas was furnished by Charles Denton, local LP-Gas agent. After giving the proposition study and consideration it was decided to present the issue to the Reconstruction Finance Corp. of Washington, D. C., and to obtain their recommendations first.





**BLODGETT**

## MORE "DOUGH" FOR YOU IN '42

Heavy-duty commercial baking and roasting oven installations will keep your tanks working for you—every day during 1942. That's why so many seasoned operators are concentrating their sales efforts on Blodgett Baking and Roasting Ovens. Send for literature . . . but start selling today!

- Just as Easy to Sell
- Just as Easy to Install
- Increases Volume
- Decreases Delivery Cost

**THE G. S. BLODGETT CO. INC.**  
53 Maple Street, Burlington, Vt.

## For *Added Power* with **LESS FUEL!**

### THICKSTUN Butane Manifolds

At least 21% more power and 10% better mileage over the standard gasoline type manifold are offered you by the Thickstun Butane Manifold.

On an International DR-50, the use of a Thickstun increased fuel mileage from 5 mpg *without* trailer to 5.6 mpg *with* trailer. On Mack trucks with Thickstun manifolds, power was increased one-half gear and operation was smoother.

(As reported in *Butane-Propane News*, August, 1941, pp. 74-75-76.)

Write for prices, other details, to Dept. B-2

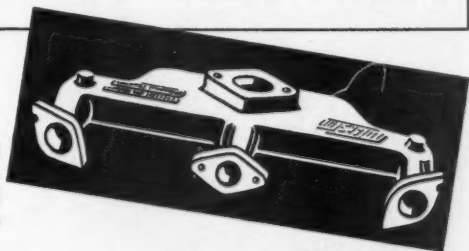
**ELECTRIC AND CARBURETOR ENGINEERING CO.**

2223 E. 8th St.

"Pioneers of the Butane Industry."

Los Angeles, Calif.

FEBRUARY-1942



### SIX REASONS WHY

1. No Hot Spots
2. Even Distribution
3. No Restrictions
4. Proper Finning
5. Bigger Internal Area
6. Greater Efficiency

# DEFEND HEALTH

WITH A

## CONTINENTAL WATER HEATER

• • •  
AMERICA NEEDS  
PHYSICAL FITNESS

Good health depends on  
cleanliness and cleanliness  
depends on hot water.

A.G.A.  
Approved



SPARTAN  
Automatic  
Storage

**Continental**  
WATER HEATER CO. LTD.

1801 Pasadena Ave., Los Angeles

# McNAMAR *Tanks*

- TRUCK TANKS
- TRANSPORTS
- SKID TANKS
- STORAGE TANKS
- UNDERGROUND  
SYSTEMS

All tanks ASME U-69, inspected by  
Ocean Accident & Guarantee Corp., Ltd.

**McNAMAR**  
BOILER AND TANK COMPANY

Tulsa, Oklahoma

Salem, Illinois

## A.G.A. Grants Extension for Approvals Expiring in 1942

To insure that approved gas-burning equipment is kept abreast with modern standards, extension of American Gas Association approval has for some time been limited to a period of five years. Recognizing the difficulties in making constructional changes under present conditions, it was felt that a temporary modification of the present policy was indicated. Agreement was, therefore, reached that an extension of one year should be allowed in the case of equipment certification of which expires during the year 1942. It was expressly understood that such extension was permissible provided that no changes had been made in applicable standards affecting safety since original approval was granted.

It is desired to point out that a large majority of requirements in effect Jan. 1, 1942, involve extensive modifications from those in existence five years ago. Preliminary study indicates that most equipment on which approval expires in 1942 will require re-examination in order to permit certification after that time. In the meantime, anyone desiring further information may address R. M. Conner, Director, American Gas Association Testing Laboratories, 1032 East 62nd Street, Cleveland, Ohio.

## Prices Are Pegged on Stoves By Price Administrator

Maximum manufacturers' prices for household cooking and heating stoves were set Jan. 2 at approximately 2% above mid-October levels by Price Administrator Leon Henderson, effective Jan. 5.

Top prices charged for stoves may not exceed 112% of the lowest price quoted or charged by manufacturers between Jan. 15 and June 1, 1941.

# Here's Your MARKET

As America's all-out Victory program gets under way there will be an unprecedented demand for convenient, inexpensive, easy-to-install gas heating equipment. Be shrewd! Order the new Peerless Wall Heaters. They're available in a wide variety of standard colors.



## PEERLESS

MANUFACTURING  
CORPORATION

INCORPORATED  
LOUISVILLE • KENTUCKY

No. 7602—2 radiants  
Heavy Steel Front



Capacities range from  
8,000 to 20,000 BTU.

## Good advice: Hurry in your orders for all Butane Gas Equipment!



Our foresight in preparing large stocks in advance of requirements has placed us in splendid position to meet your needs now, when war restrictions are making the going pretty tough . . . but you had better rush in your orders without delay! Write—or wire—us NOW!

## SOUTHERN GAS & EQUIPMENT CO.

Little Rock,  
Arkansas

ALL TYPES LPG EQUIPMENT

Birmingham,  
Alabama

*"Serving Arkansas, Louisiana, Missouri and the Southeast"*

## Dealer Describes Honolulu Bombing

A LITTLE of the tragedy of the bombing of Pearl Harbor by the Japanese on Dec. 7 is revealed in a letter received from E. S. Jones, chief engineer of the Honolulu Gas Co., distributors of city gas within the city of Honolulu and liquefied petroleum gas in outlying districts.

The letter, addressed to Jay Jenkins, publisher of BUTANE-PROPANE News reads:

On the morning of Dec. 7, the Japanese planes made a rather thorough job of bombing these islands. One bomb went through the crown of our million-foot holder, but fortunately did not explode. It left a hole about 13 inches in diameter and ignited the gas when it struck, and a very strong wind carried the flame directly across the stairway so we were considerably delayed in getting the men and material on the crown of this holder to put out the fire. Eventually sand bags and chemical extinguishers together with large asbestos mats were landed on the crown and we were able to put the fire out, after which it was a simple matter to put a plate over the hole and drill and cap screw to the crown. When I have time I intend to weld this plate. Fortunately, there was no other damage to machinery and no employes were hurt, although shrapnel and parts of anti-aircraft shells were constantly falling on the plant for hours.

"We are living in rather rigid wartime conditions under martial law and everything in the way of necessary supplies frozen. Orders for materials all have to be approved by the U. S. Engineers.

"Operating a plant of this size under blackout conditions is quite a

problem as we are running 24 hours and signal lights on the automatic control on the generator as well as boiler gage glasses have to be inspected regularly. We do this with very dark blue lights and luminous phosphorescent paint on the oil meters and gages. All buildings are completely blacked out by heavy black paint on the windows and the necessary lights are completely shaded from outside. In addition to this problem this entire area has been evacuated, and as our gasmakers and boiler firemen and operators nearly all lived in company cottages adjacent to the plant, it is very difficult to know whether we are going to have a crew on the midnight watch or not. At present I have about 10 men sleeping in my office and our Home Service girls have organized the cooking and supply us regularly with the necessary food. It is absolutely impossible to travel on the streets after dark, so all men that come on shifts or go off shift after dark must get through the military guards during daylight hours.

"Unfortunately, taking photographs was the last thing we had in mind, so none were obtained. I hope however, before long, to get some photographs and the story on the new construction work still going on at this plant."

Sincerely,

E. S. JONES,  
Chief Engineer.



### Melville Schumacher is LP-Gas Sales Head in Covington, La.

A. R. Blossman, distributor of butane gas and equipment in Louisiana and Mississippi, with headquarters at Covington, La., has announced the promotion of Melville Schumacher of Bogalusa, La., to sales manager in charge of all territories served.

# CONSULT ALGAS

**FOR BUTANE METHODS TO  
SOLVE YOUR DEFENSE PROBLEM**



Algas Butane Installations of all types are helping industry meet war-time production schedules. Algas engineers and expert field men invite your inquiries.

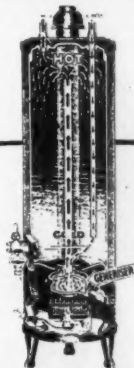
*Also manufacturers of Algas Multi-Jet Carburetors  
for butane-propane fuels*

**AMERICAN** LIQUID GAS CORPORATION ★  
LOS ANGELES CHICAGO

*Feature for Feature...*

**THE BEST WATER HEATERS  
IN EVERY PRICE CLASS!**

Manufactured in every size and price range, General Water Heaters build load and good will everywhere they're sold. Every unit backed by liberal and truthful guarantees. Be SPECIFIC—Recommend GENERALS!



**L.P.G.** *eneral*  
**WATER HEATERS**

**SPECIFICALLY  
MADE FOR  
BOTTLED  
GASES**

General Water Heater Corp., 7 East Cypress Avenue, Burbank, Calif.  
San Francisco • Detroit • Kansas City • Dallas • Houston • Memphis

DISTRIBUTED IN PRINCIPAL CITIES THROUGHOUT THE NATION

FEBRUARY-1942

101

# PITCO *Frialators*

REG. U.S. PAT. OFFICE

## ARE DUAL USAGE L. P. GAS APPLIANCES

### *Deep-Fat Frying at Its Best*

- ★ Customers can serve a wider variety of fried foods.
- ★ Left-overs or by-products quickly converted into daily specials.
- ★ Increase in customer business means increase in the gas load.
- ★ Actual saving in fat alone more than pays total cost of gas required to operate them.

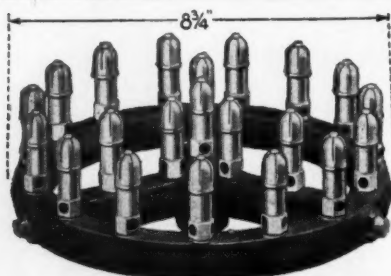
**Do Your Part . . . Conserve Fat**

*Send for 1942 Illustrated Catalog.*

**J. C. PITMAN & SONS,**  
INCORPORATED

711-719 Broad St.

Lynn, Mass.



No. C 210 Barber Burner

## BARBER APPLIANCE BURNERS

The burner is the heart of the appliance. Barber Units are correctly designed, with the proper jets, to fit the individual appliance, and give complete combustion on Butane-Propane Gas. Appliance makers and fuel distributors assure better service and economy for their customers by recommending the use of Barber Burners. Submit your burner problems to us. Catalog of complete line on request.

**THE BARBER GAS BURNER CO.**  
3704 Superior Ave. Cleveland, Ohio

## Five-Year-Old Water Heater Plays Part in Defense

In 1937 the LaPorte Bottled Gas Co., 619 Lincoln Way, La Porte, Ind., installed in the barbecue establishment of C. P. Smith, Wellsboro, Ind., a 30-gal. FauceHot water heater that is just now beginning to strike its stride of service.

Mr. Smith's restaurant has catered to the usual trade throughout the intervening years, but since the recent establishment of the large Kingsbury ordnance plants nearby, he has found it advantageous to open a gasoline station and a trailer camp having capacity for 25 trailers. This opportunity was due to the influx of workers for the construction and operation of the ordnance plant who could not find sufficient housing facilities.

So now, this water heater is not only serving its normal restaurant duties but is also providing hot water for laundry and other purposes to the 25 families permanently living in "The Garden," as Mr. Smith calls his camp. Dri-Gas is the fuel used.



## Butane Engineering Co. Has New Truck and Trailer

Butane Engineering Co., Sacramento, Calif., operated by C. M. Cerati, has purchased a new truck and trailer with a capacity of 7300 gals. to supplement the present 4000-gal. transport rig.

The new tanker will haul propane exclusively.



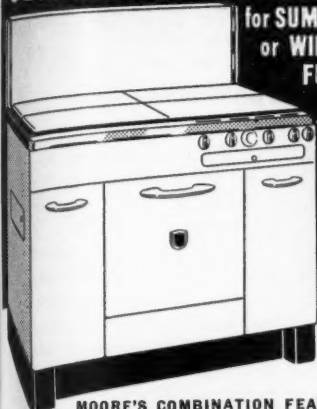
## Monticello, Ind., Gets Philgas

The Kenney Implement Co., 227 No. Main St., Monticello, Ind., has been appointed distributor of Philgas products for that community. A line of Philgas stoves will soon be stocked and put on display.



## MOORE'S COMBINATION RANGES

for SUMMER  
or WINTER  
FUEL

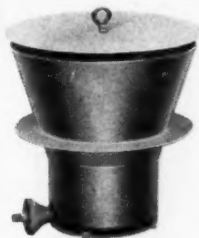


MOORE'S COMBINATION FEATURE:

- Coal or oil and LP-Gas • 4 gas top burners
- 2 or 4 coal or oil covers • No dampers to operate
- Full oven size on all fuels • No baffles to handle

**THE MOORE CORPORATION**  
Quality Since 1857 JOLIET, ILLINOIS

## GREENHOUSE HEATERS



Model No. 210 NV

**Greenhouse Owners**

Welcome This Modern, Inexpensive  
Method of Heating with LP-Gas.

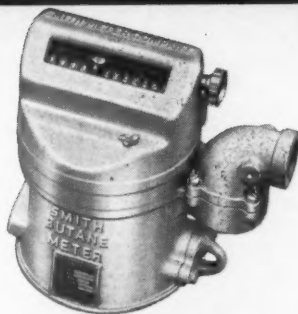
Write to

**F. & E. Mfg. Co.**

P. O. Box D

Centerville, Calif.

## THE LAST WORD in Modern Metering



**NEW BU-40  
SMITH LIQUID BUTANE METER**

**For Tank Trucks and Dispensing Racks**

● Put an end to costly metering errors with new BU-40 Smith Meters . . . precision-built on the exclusive Smith rotary principle and combined with advanced engineering to assure accurate metering of liquefied petroleum gases.

The Smith BU-40 Liquid Butane Meter has a capacity of 50 G.P.M. Operates with 250 lbs. working pressure. Equipped with built-in strainers. No reciprocating or oscillating pistons or valves to wear and impair accuracy or retard flow. Available in Master model for corrosive gases or Standard model for non-corrosive gases. Choice of (1) horizontal re-set counter, (2) 10" vertical dial, (3) large numeral register, (4) large numeral register and ticket printer. Either or any of the above with or without set stop mechanism.

For complete details write for Bulletin No. 123

## SMITH METER COMPANY

SUBSIDIARY OF A. O. SMITH CORPORATION  
Factories at Los Angeles and Milwaukee

Sales Offices  
NEW YORK, CHICAGO, HOUSTON,  
LOS ANGELES

LOCAL STOCKS AT CONVENIENT POINTS  
LOCAL AGENTS IN ALL PRINCIPAL CITIES

## Butane Fuel-Users Are Encouraged

Two favorable replies to resolutions sent farm leaders by the Kings County (Calif.) Farm Bureau board of directors urging continuance of the supply of butane fuel for tractors and other farm equipment were received by T. B. Hooker, bureau president, today.

In a letter from John W. Frey, federal director of marketing, was stated, "It is hoped that plans for increased production of butane will result in maintaining its present economic distribution although its use for direct war purposes is primary."

Ray B. Wiser, president of the California Farm Bureau Federation stated in his reply that, at present there will continue to be a supply of butane for fuel for tractors and farm equipment.

## Southern Section, L.P.G.A., Calls Off Annual Meeting

Following the similar action of other organizations, due to the war emergency, the Southern Section of the Liquefied Petroleum Gas Associa-

tion has called off its annual convention, formerly scheduled for May 25-27 at Tulsa, Okla., according to K. H. Koach, Chairman.

A photo of the Section's officers in session is shown below.

## N. B. Bertolette Joins A.G.A. Laboratories

Filling the vacancy caused by the resignation of N. T. Sellman, assistant vice president of the Consolidated Edison Co., of New York, Inc., Norman B. Bertolette, president and general manager of the Hartford Gas Co., was recently appointed a member of the A. G. A. Laboratories Managing Committee. He is the first executive from the New England area to become a member of this group.

## Butane Solves Uniform Heat Needs for Earle, Ark., Theater

The Leonard Warden Co., of West Memphis, Ark., has installed a butane system at The Strand Theatre, at Earle, Ark., to afford uniform heat in that building during the winter months. Two large radiators and four or five smaller ones were installed.



These officers of the Southern Section, L.P.G.A., held a special session in New Orleans on Jan. 9 to discuss problems of interest to their membership. **STANDING:** J. L. Grigaby, vice chairman; T. G. Tackett, secretary; H. S. Phillips, vice chairman. **SEATED:** H. W. Manley, vice chairman; K. H. Koach, chairman, and R. L. Edwards, vice chairman.

**L.P.G. Dealers Attention  
BE  
PREPARED  
FOR**

**SUB-ZERO  
Temperatures**

Use our  
Winter Grade  
**BUTANE-PROPANE**  
Mixtures.

*Long term contracts solicited.*

**Clute Petroleum  
Company**

National Bank of Tulsa Bldg.  
Tulsa, Okla.

**Pacific Coast Distributors for  
Bastian-Blessing L.P.G. Equip-  
ment • Dayton Dowd Pump Co.**

**International Distributors for  
Day & Night I.C.C. Cylinders**

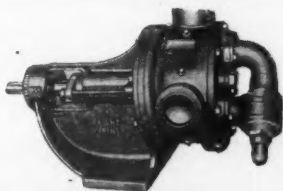
**Manufacturers of  
Vapor Differential Compres-  
sors; Roney Valves & Fittings**

**LARGEST AND MOST EXPERIENCED  
MANUFACTURING ENGINEERS AND  
JOBBER'S OF I. P. G. EQUIPMENT**

*Whatever the Need  
Whatever the Problem  
"WRITE RONEY"*

**L.C. RONEY INC.**  
1740-44 W 59<sup>th</sup> ST. - LOS ANGELES, CALIF.

# **NO PRIORITIES ON THE CORRECT Answer To Pumping PROBLEMS**



Under present conditions, with priorities in effect on all types of machinery, the correct answer to your pumping problem is doubly important. You can't afford to gamble. Today, more than ever before, pumps must DELIVER. So industry depends on Viking Rotary Pumps, backed by their long record of rugged, trouble-free performance.

If you have a pumping problem, tell us about it. We'll do our best to help you. Our Viking installation and maintenance booklet free on request.

Bulletin 2303-41 gives specifications on all Viking Butane-Propane models . . . explains in detail Viking's many safety features. Write for it.

**VIKING PUMP  
COMPANY**  
CEDAR FALLS, IOWA

## BUTANE and PROPANE TANK HEADS

A.S.M.E. type  
for the manufacturers of  
BUTANE & PROPANE TANKS

\*\*\*\*\* STANDARD RADIUS \*\*\*\*\*  
\*\*\*\*\* 80% RADIUS \*\*\*\*\*  
\*\*\*\*\* ELLIPSOIDAL \*\*\*\*\*

DIAMETERS UP THROUGH 60"  
THICKNESS UP THROUGH 1/4"

*Write for Head Catalog*

*The* COMMERCIAL SHEARING &  
STAMPING COMPANY  
YOUNGSTOWN, OHIO.

## HEALTH "PRIORITIES" FOR L.P.G. USERS



L.P.G. dealers praise the economy and automatic performance of PACIFIC Gas Heating Appliances. They know that Pacific's complete L.P.G. line is engineered to fit today's L.P.G. needs exactly. Now, with National attention focused on conservation and health, dealers can capitalize on the time-tested operation economy and automatic, healthful temperature control of Pacific heaters.

Investigate the profit possibilities  
of the PACIFIC line today.

**PACIFIC GAS RADIATOR CO.**  
Huntington Park, California

## FOR YOUR CONVENIENCE

*U. S. Defense Stamps* will be accepted at face value for all payments on subscriptions to **BUTANE-PROPANE News**.

## Albert W. Humm Will Specialize In Home Appliance Advertising

Albert W. Humm has joined Hixson-O'Donnell Advertising Inc., New York to organize and manage a public utility and home appliance department.

Mr. Humm has had wide experience with public utility and home appliance advertising and promotion. For 20 years he was advertising and sales promotion manager of Standard Gas Equipment Corp., manufacturers of domestic and hotel ranges and equipment. He was also active in the work of the American Gas Association.



## J. E. Walling Enters Butane Business in Haskell, Texas

J. E. Walling, Jr., Humble Oil Co. agent of Haskell, Texas, has entered the butane business in his territory and will handle systems.

He has purchased a 1200 net gallon butane tank for truck chassis, complete with pump and power take-off and hose, from Dallas Tank & Welding Co., Inc. The tank is 54 in. in diameter by 149 in., with 125-lb. working pressure.



## Implement Firm Takes Skelgas Agency in Kewanee, Ill.

Announcement has been made by the Farmers Implement Co., 612 No. Tremont St., Kewanee, Ill., that it has taken the agency for the Skelgas ranges, other appliances and Skelgas service.

Properly  
... But  
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CR  
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Original

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No

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HC  
100

FEB



### for LIQUEFIED GAS

#### Nutrition and National Defense

Properly prepared foods are an aid to National Defense . . . hence, it pays to concentrate your efforts on Crown ranges because they assure the finest cooking and eating. They are engineered to minimize the loss of minerals and vitamins in foods . . . are substantially constructed for long dependable service, with a record of 55 years of manufacturing behind them. Write!

## CROWN STOVE WORKS

4631 W. 12th PLACE, CHICAGO

Originators of BUFFET and DIVIDED TOP GAS RANGES

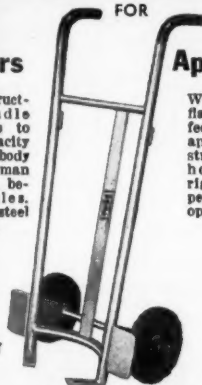
## THOMAS TRUCK of Keokuk

### DOUBLE-DUTY HAND TRUCK

FOR

#### Cylinders

Double constructed to handle cylinders up to 200 lbs. capacity. Tapered body gives serviceman ample room between handles. All welded steel construction.



No. 77

#### Appliances

Wide Bottom flanges give perfect support for appliances. Web strap (optional) holds appliance rigidly to truck, permits one-man operation.

8-inch, ball bearing, puncture proof cushion pneumatic tires prevent damage to lawns—provide easier rolling on hard surfaces. Write for prices and descriptive folder today.

## THOMAS TRUCK and CASTER CO.

222 Mississippi River

Keokuk, Iowa

# KEEP FAITH WITH YOUR CUSTOMERS

Your customers depend upon you for uniform, high-quality fuels. Keep faith by giving them the very best—Philgas Propane or Butane! With Philgas supplying your needs you are sure of a uniform, high-quality product at all times.

But high quality is not the only advantage you gain by dealing with Philgas! Prompt deliveries are assured by adequate manufacturing, storage and transportation facilities; and the services of competent Philgas engineers are available to you when needed.

Investigate the many "plus" advantages of Philgas today! It will be well worth your while—and there will be no obligation.

*Philgas*  
DIVISION

PHILLIPS PETROLEUM COMPANY

GENERAL MOTORS BUILDING  
DETROIT, MICHIGAN

NEW YORK

MILWAUKEE

PHILADELPHIA

ST. LOUIS

CHICAGO

AMARILLO

BARTLESVILLE, OKLA.

THE NATION'S LARGEST MARKETER  
OF LIQUEFIED PETROLEUM GASES

## Butane Griddle Brings In Prospects

**A** FIVE-GALLON LP-Gas bottle, connected to a small griddle stove, serves to advertise the business of the Finnigan Furniture Co., Lawton, Okla., says Charles Finnigan, owner.

Mr. Finnigan does not attempt to sell or even rent the equipment when used for advertising purposes but furnishes it free to picnics and meetings which he attends in Lawton and vicinity.



Charles Finnigan demonstrates his LP-Gas griddle stove equipment which is easily connected to a 5-gal. bottle.

"The people who see this equipment in operation ask questions which give me an opportunity to explain the LP-Gas part of my business and sometimes lead to sales of household appliances and furniture," said Mr. Finnigan.

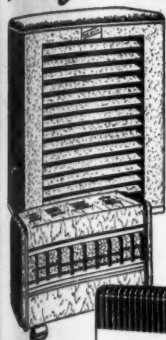
"On this griddle plate I can fry a large beefsteak in five minutes under the super-heat of a mixture of butane and propane gas, and I believe there are commercial possibilities in the sale or rental of such equipment to campers, automobile trailer owners and to others."

When he entered the second hand furniture business in Lawton two and a half years ago, Mr. Finnigan had no idea of adding a line of LP-Gas equipment and appliances. "I just drifted into this line," he said. "I found that it fitted so nicely into the used furniture business that I have gradually added to my stock of butane-propane gas equipment and appliances. Farmers had old, coal, wood, gasoline or oil burning stoves which they wanted to dispose of, and I soon learned that I could take these in on butane-propane gas stoves, so I started stocking them. My experience in the used furniture business helped me to sell these old stoves to others who were not yet using gas."

The Finnigan Furniture Co. does not deal directly in underground butane tank systems but confines its operations largely to sales of 100-lb. cylinders or 5-gal. bottles. The firm usually places a single cylinder, filled with the proper mix-

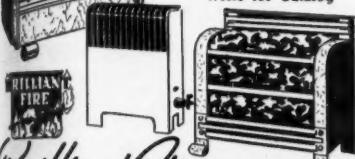


## Profit Building LPG HEATERS



LPG Dealers find real profit in BRILLIANT FIRE sales because the product is time-tested, trustworthy. Geared for economy operation and negligible servicing. These popular heat-makers are offered in a variety of styles for every home need.

Write for Catalog



**Brilliant Fire GAS HEATERS**

THE OHIO FOUNDRY & MANUFACTURING CO.

QUALITY HEATING EQUIPMENT SINCE 1846

STEUBENVILLE, OHIO


# VALVES

and

# Accessories

for

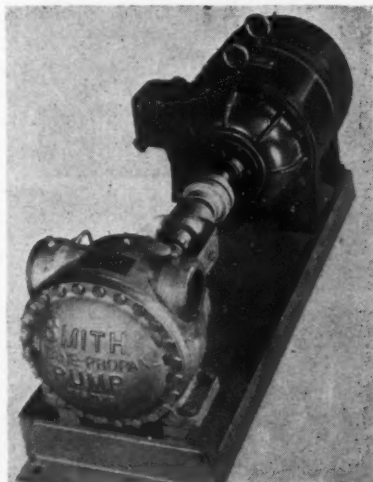
## Gas Burning Appliances



THE W. J. SCHOENBERGER CO.  
CLEVELAND · OHIO

## WHY SMITH PUMPS ARE BETTER

Their exclusive balanced gear construction, providing double opposed inlets ports and double opposed outlet ports surrounding each gear, cancels out and practically eliminates the usual high pressure bearing loads within the pump.



SMITH PUMPS are provided with an exclusive fluid-sealed packing box construction which entirely prevents the leakage of hazardous gases. They are designed for working pressures of 250 lbs. per sq. in. and are on the approved list for either butane or propane service.

**8 Models for Every Requirement**

SMITH PRECISION PRODUCTS CO.

1135 Mission St. South Pasadena, Calif.

# SMITH

BUTANE-PROPANE

# PUMPS

Order These Famous L. P. Gas  
Products From Us . . . .



**BASTIAN-BLESSING**

**THE DAYTON-DOWD CO.**

**Hackney**  
BUTANE-PROPANE CYLINDERS

**L.C. RONEY INC.**

**The IMPERIAL  
BRASS MFG. CO.**

**GAS EQUIPMENT CO., INC.**

2620 South Ervay Street, Dallas, Texas

**GAS EQUIPMENT SUPPLY CO.**

1157 West Peachtree Street, Atlanta, Georgia

## WANTED

**ANY SIZE I.C.C. CYLINDERS  
NEW OR USED**

Working pressures from 4-B-240 down to  
7-150 required.

Now or later you may have extra cyl-  
inders you may not need under present  
conditions.

We use many sizes and probably  
could use any size cylinder from 10 to  
20 pounds capacity upwards.

**IMPERIAL GAS CO.**

3625 South Flower St.  
Los Angeles, Calif.

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### EQUIPMENT FOR SALE

PROPANE STORAGE TANKS, 150 GAL-  
lons capacity and 2000 gallons capacity, L.C.G.  
inspected, 200 pounds working pressure, ex-  
cellent condition. Also Butane Storage Tank,  
11 ft. diameter by 40 ft. long. Address POWER  
CONSTRUCTION COMPANY, Minneapolis,  
Minnesota.

PROPANE OR BUTANE STORAGE TANKS,  
complete with gauges and fittings, constructed  
under A.S.M.E. Code. Used very little. Ad-  
dress Box 65, BUTANE-PROPANE News, 1709  
W. 8th St., Los Angeles.

ture of butane and propane, with  
householders who wish to use it for  
operating a kitchen range or a hot  
water heater. If the customer de-  
cides to expand his use of butane-  
propane, Mr. Finnigan either adds  
another cylinder or cooperates with  
the Dyer Butane Gas Co., in Law-  
ton, in furnishing an underground  
butane system.

The cylinders usually are set  
aboveground. In the southern Okla-  
homa climate it is not necessary to  
provide shelters for the cylinders.

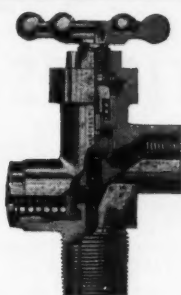
T. A. Dyer, manager of Dyer  
Butane Gas Co., stated that he  
avoids cold weather troubles from  
aboveground cylinders in the win-  
ter by a 50-50 mixture of butane  
and propane which he changes to a  
70% butane—30% propane mix-  
ture in the summer.

## Control

PROPANE-BUTANE  
CYLINDERS

THIS POSITIVE WAY—

**KEROTEST  
PROPANE-  
BUTANE**



**CYLINDER VALVES are:**

- **DIAPHRAGM PACKLESS**—require least maintenance.
- **SAFE**—automatic safety-vent releases only excess pressures.

Write for Catalog

**KEROTEST**

**KEROTEST MANUFACTURING COMPANY  
PITTSBURGH PA**

## HOT Water UNITED STATES

*Automatic Water Heaters*

Approved by A.G.A. for  
Liquefied Petroleum Gas

**United States Heater Co.**  
COMPTON, CALIFORNIA

## FauceHot

*Gas Water Heater*



with AIRE-LOK, the radically new principle of AIR CONTROL, which cuts fuel cost by sharply reducing stand-by loss. Air-Lok is only one of a complete line of especially designed, Baco equipped LPGas water heaters. Write for details.

**FauceHot HEATER CO.**

LA PORTE

INDIANA

Chicago office: Peoples Gas Bldg.

## Are You in a Haze?

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## Butane-Propane NEWS Research Department

for assistance. Our technical staff will gladly endeavor to answer all legitimate inquiries (except legal and financial) about the LP-Gas industry which regular subscribers choose to submit.

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Your Position.....

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Your Question.....

Mail to BUTANE-PROPANE News,  
1709 W. 8th, Los Angeles, Calif.

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With  
**SINCLAIR**

PROPANE and BUTANE



Uncle Sam  
Comes First

Uncle Sam comes first with us, and we know he comes first with you, too! We are proud of the privilege of doing our part for America, and Americans. Proud that Sinclair production standards are also appreciated by our government.

Sinclair contract customers are being supplied with their expanded seasonal requirements, and we will continue our policy of customer cooperation. This is so that America's united effort may go forward—without interruption.

We plan to do even more—to keep frank, friendly relations alive with our customers, and their customers. The war will end some day, and we are confident that Sinclair LP-Gas will be more popular than ever before.

**SINCLAIR PRAIRIE OIL COMPANY**

LIQUEFIED PETROLEUM GAS DIVISION

SINCLAIR BUILDING

TULSA, OKLA.

# 1

**ON BUTANE DELIVERIES**



In marketing butane, satisfied customers are priceless assets, for your business depends upon their continued patronage. When customers question a handwritten delivery receipt, it's usually only your word against theirs. Unpleasant and costly disputes can result. One of the surest ways to avoid losing customers is to use Brodie Meters and Brodimatic Printing Counters, for gallonage totals are mechanically added and plainly recorded on meter-printed delivery receipts. Readings can't be misfigured and figures can't be misread. Write today for full details.

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**EQUIPPED WITH**

**RALPH N. BRODIE CO., Inc.**

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